The Builder.

VOL. XXX.—No. 1558.

Building Stones.

PROFESSOR Hull's book* will be received with welcome by those whose knowledge of the distribution of the many kinds of stone is but limited. Mr. Hull has had unusual opportunities of acquiring information on the distribution of stones and of their qualities from a geologist's point of view. The book would have been much improved if the author could have added to his description of the qualities of stones their strength to resist pressure; but this he does of only two kinds,—those of granite and sandstone, the former of which he says will resist a pressure of from 2,300 lb. to 13,400 lb. per square inch or rather that the experiments made by Mr. Wilkinson on the granites of Ireland show that it requires those weights to crush cubes of 1 inches, the strongest coming from Newry, county Down, and the weakest from Ballyknockan. The stone from Killiney and Kingstown gave good results. To those whose knowledge of geology and mineralogy is somewhat rusty it will be news to hear that the quartz of granite contains minute cells partially filled with water. Primarily granite consists of quartz, felspar, and mica, and Mr. Hull shows how its composition varies into five different forms. Syenite contains two of the elements of true granite, viz., quartz and felspar, but varies from it inasmuch as it contains hornblende instead of mica; and syenite itself varies in its constituents in two ways; thus, when the free silica (or quartz) disappears, the rock passes into diorite, and when, in addition to quartz, felspar, and mica, hornblende appears, it becomes syenitic granite.

The specific gravity of granite varies from 2·6 to 2·9, and it contains from 65 to 81·7 per cent. of silica. Taking the specific gravity of ordinary granite at 2·66, a cubic foot weighs 166·2 lb., and a cubic yard as nearly as possible 2 tons,—just about twice the weight of a cubic yard of coal. It contains about 0·8 per cent. of water, and is still capable of absorbing about one-fourth more, or 0·2 per cent.; so that a cubic yard of 2 tons contains in its ordinary state about 3½ gallons of water, and some specimens can absorb nearly a gallon more. It is important, in selecting specimens of this rock for structural purposes, to observe the quantity of water they are capable of absorbing, as the influence of frost on stone is in proportion to the quantity it takes up. The pillars of the Carlton Club-house and the Fishmongers' Hall, in London, are of Peterhead granite (Aberdeenshire), also the columns of the interior of St. George's Hall, Liverpool, and those of the Provincial Bank of Ireland, in Dublin. This granite weighs 165 lb. 14 oz. per cubic foot. It is quarried at Stirling Hill. The granite used in the Liverpool, Birkenhead, Newport, and Swansea docks is from Craignair and Creetown, in Kircudbrightshire; also the Liverpool Borough Bank; it is of a greyish colour. It was once supposed that granite is the oldest of rocks, but it is now known that granites have been formed at several geological periods. The granite of Cornwall and Devon is of more recent formation than the carboniferous system, and that of the Alps of Savoy more recent than the Jurassic (oolitic), while that of the Eastern Pyrenees is more recent than the white chalk. On the other hand, the granites of Scandinavia, the Highlands of Scotland, Donegal, and Galway, are of great antiquity, being older than the Devonian rocks. The granites of Devon and Cornwall are of an age intermediate between the lower carboniferous and Triassic periods. Of this stone the following works are built, wholly or partially:—London Bridge, Waterloo Bridge, Westminster Bridge, the Thames Embankment, and the Tomb of the Duke of Wellington in St. Paul's Cathedral. The syenitic granite of Mount Sorel, in Leicestershire, is of a warm rose tint, and much esteemed for ornamental purposes, but it is extremely hard and difficult to work. It makes very good paving-stone. The granite of Shap, in Cumberland, is a very handsome porphyritic stone. Its prevailing colour is a rich reddish brown. It takes a fine polish, and is now systematically worked by a company, who have set up machinery for cutting and polishing by the side of the Lancaster and Carlisle Railway, near Shap Station. In Ireland granite is found in Donegal, Galway, Mayo, Wicklow, Wexford, Down, and Armagh. The use of granite for architectural purposes, says the author, "is splendidly illustrated in the city of St. Petersburg, to which it is brought from Finland. Here, not only the Imperial palaces and public buildings are constructed with this material, but even ordinary dwellings are partially or wholly built of it; so that St. Petersburg may be considered a city of granite."

The granite of Syene occupies large tracts in Upper Egypt between the first cataract and the town of Assouan, the ancient Syene. It was extensively quarried by the Egyptians 1,300 years before the Christian era, and fashioned into columns, obelisks, sarcophagi, and colossal statues, which are now scattered over Europe, embellishing the cities and galleries of France, Germany, and especially Italy. The marks of the pick and chisel are still fresh in these ancient quarries.

Serpentine, highly esteemed for ornamental purposes in architecture, has a specific gravity of from 2·5 to 2·7, and contains from 38·49 to 44·22 per cent. of silica. It is not suitable for out-door use, especially in the atmosphere of towns; for, being acted on by hydrochloric and sulphuric acids, it is liable either to decay or to become tarnished.

Marble is crystalline limestone, capable of receiving a polish, and, in Great Britain, is derived from the Devonian, carboniferous, Purbeck, and Wealden formations. The specific gravity varies from 2·6 to 2·8.

Gypsum is a hydrous sulphate of lime, consisting of 32·56 parts of lime, 46·51 of sulphuric acid, and 20·93 of water. In its crystalline form it occurs as selenite, which is translucent and colourless; or as satin spar, or fibrous gypsum, also colourless.

Anhydrite is a variety of gypsum, free from water. Its composition is lime 41·18 parts, sulphuric acid 58·82. Its specific gravity is from 2·8 to 3, and it is much harder than gypsum. The chief source of gypsum in this country is the new red marl of the Triassic formation, and the locality that probably yields the largest quantity is Chellaston Hill, near Derby. It is chiefly used in the manufacture of plaster of Paris. Other localities are Orston, near Grantham; the neighbourhood of Newark-on-Trent; Fauld, near Tutbury; St. Bee's Head, near Whitehaven; several localities in Nottinghamshire and Staffordshire; Aston, in Cumberland; and in the vicinity of Watchet, in Somersetshire; also in the isle of Purbeck, in Dorsetshire. The author also treats of many of the rarer ornamental stones, as fluor spar, rock crystal, malachite, &c., and then proceeds to the calcareous group of building stones, which, in this country, are derived from the carboniferous Permian, and oolitic formations.

The carboniferous limestone is the foundation on which has been reared that great superstructure of sedimentary rocks, which in Lancashire attains the enormous thickness of 18,600 ft., and includes the Yoredale rocks, the millstone grit, and the coal measures.

In Derbyshire, the limestone consists of very pure granular or crystalline carbonate of lime, of grey or bluish colour, with occasional bands of a silicious stone called "chert." Its upper beds are dark, and produce black marble. The whole mass is about 5,000 ft. thick, and appears to be composed of the remains of corals, crinoids, and molluscs. Its chief use is for mortar, cement, marbles, and for fluxing iron ore. The grits and sandstones of the millstone and Yoredale series generally occur in the neighbourhood of the limestone, and are preferred to the limestone as a material for building. In Denbighshire and Flintshire the limestone is similar in appearance and composition to that of Derbyshire. In the south-west of England it forms an encircling zone round the Somersetshire coal-field, and rises into the table-land of the Mendip Hills.

Excellent building stone is procured from the magnesian limestone of the Permian formation. Near Mansfield, in Nottinghamshire, there is an upper and lower bed of magnesian limestone, with intermediate marls and sandstones. The lower bed is the more important, attaining a thickness of from 70 ft. to 100 ft. It is variable in quality, and at Mansfield passes into a white calcareous sandstone. The compositions of the white and red Mansfield stones (silicious dolomites) are nearly alike, the white containing 51·40 per cent. of silica, and the red 49·40; of carbonate of lime the white contains 26·50 per cent., and the red the same; of carbonate of magnesia, the white contains 17·98 per cent., and the red 16·10 per cent.; but of iron, the red contains 3·20 per cent., while the white has only 1·32 per cent.

The stone from the Mansfield Woodhouse quarries is a crystalline limestone of a fine yellow colour, in some places speckled with black. Southwell Minster is built of it (twelfth century); so is the Martyrs' Memorial at Oxford. Bolsover-moor stone is very similar; it is a yellowish-brown dolomite, compact and fine grained, but variable in quality, and requires careful selection. The stone from Anston, in Yorkshire (of which the Houses of Parliament are built), includes some stone of good quality. The front of the Museum of Practical Geology, in London, is built of it. The other important quarries of magnesian limestone are at Brodsworth, Cadeby, and Park Nook, near Doncaster; Huddlestone, near Sherburne; and Sonawse, near Tadcaster. Bolsover stone contains 51·10 per cent. of carbonate of lime, 40·20 of carbonate of magnesia, 1·80 of oxide of iron and alumina, and 3·60 per cent. of silica, the remainder being water and loss. Mansfield Woodhouse stone is similar, containing 51·65 per cent. of carbonate of lime, 42·60 of carbonate of magnesia, only a trace of iron and alumina, and 3·70 per cent. of silica. The specific gravity of a dry mass of Bolsover stone is 2·316; the weight of a cube of 2 inches in the ordinary state is 4890·8 grains; when dried, 4881·4 grains; when saturated with water, 5042 grains. One specimen from Cadeby absorbed one-fourth of its bulk of water.

The oolitic limestones are generally soft when first quarried, but harden afterwards, uniform in texture, white, cream-coloured, or yellow, and are composed of fragments of shells cemented by calcareous oolitic material, or else of small grains, or ovules, of carbonate of lime firmly bound together. It is owing to this structure

* A Treatise on the Building and Ornamental Stones of Great Britain and Foreign Countries. By Edward Hull, M.A., F.R.S. Macmillan & Co. 1872.

that the formation has received the name of oolite; but as these strata are largely developed in the Jura mountains, geologists are now inclined to adopt the name of Jurassic in preference to colitic. In the Bath and Cheltenham oolite, the spherular grains are either hollow or contain as a nucleus a grain of sand, or a fragment of a shell or other foreign substance. The size of the spherules is generally about that of the roe of small fish. There are four distinct formations of oolitic limestone:—1. The lower oolite; 2, the great or Bath oolite; 3, the coralline oolite, or coral rag; 4, the Portland limestone. The first is found in the Cotteswold Hills more largely than elsewhere. This stone has probably been used in Gloucester Cathedral; the Abbey Church, Tewkesbury; Sudely Castle, and other buildings in the Vale of the Severn. The principal quarries are at Bourton, Broadway, Guiting, Stanway-hill, Clevecloud, Painswick-hill, Sheepscomb-hill, Syreford, Brockhampton, and Loughborough. The Painswick stone is of specially fine quality, approaching the Caen stone in texture. The Bath oolite is divisible into two members,—the lower, including the Stonesfield slate and oolitic freestones of Burford and Tainton; the upper, being formed of a compact white, brittle, or chalky limestone, not suitable for architectural purposes, in Oxfordshire. The most important quarries are situated along the range of the Somersetshire hills, at Stinchcombe, Minchinhampton, Bathampton and Bath Baynton, Chippenham, and Doulting. Of this stone has been built the Abbey Church at Bath, Glastonbury Abbey Church (eleventh century), and Wells Cathedral (twelfth to fifteenth century). A sample of Bath stone from Box contained of carbonate of lime 94·52 per cent.; of carbonate of magnesia, 2·50 per cent.; iron and alumina, 1·20. The coralline oolite seldom produces a building material.

The Portland limestone, forms the uppermost member of the Jurassic series. It is nearly a pure carbonate of lime, and containing 95 per cent. of this mineral, and 1 per cent. each of silica and carbonate of magnesia. It is superior to the oolitic limestones in hardness and durability in a smoky atmosphere, and it is less absorbent of moisture. When dry it absorbs 8·86 per cent. of its weight of water.

The sandstones are chiefly derived from three geological formations,—the old red sandstone, or Devonian; the carboniferous; and the Triassic: but of these, mostly from the carboniferous series of rocks. Sandstones are less injuriously affected by the acids contained in the atmosphere of towns than limestones are, whether proper limestones or oolitic; but some of them are very porous, and a careful selection of them in this respect is as necessary as with limestones in other respects. From experiments made by Mr. Wilkinson, it appears that some sandstones absorb as much as 11 lb. of water per cubic foot, while others take up no more than 1 lb. As a general result, it may be assumed, says the author, that sandstones of ordinary porosity absorb from 5 lb. to 6 lb. of water per cubic foot. Mr. Wilkinson found the crushing weight to vary from 1,680 lb. to 14,600 lb. for a cubic inch.

An account of the situation of the many sandstone quarries is given by the author, and he reprints the table of the weight per cubic foot of nearly every kind of stone prepared by the late Mr. C. H. Smith.

Another volume, by a practical hand, is still wanted, and many fresh experiments are needed.

ON THE PRICES OF AGRICULTURAL PRODUCE, LABOUR, AND RENT.

FROM THE EARLY PART OF LAST CENTURY TO THE PRESENT TIME.

This was the subject of a paper by Mr. William Sturge, read at the ordinary general meeting of the Institution of Surveyors, on the 9th inst.; Mr. E. N. Clifton, president, in the chair. After a series of statements as to the prices of agricultural produce, labour, and rent, from the early part of the last century to the present time, the writer went on to say,—For the purpose of illustrating the fluctuations in the value of land during the last 100 years, I divide the century into the following periods, viz.:—

1st. Twenty-three years ending 1794, during which there was no great increase in the price of produce, but a gradual advance in rent.

2nd. Twenty years, from 1795 to 1815, when a range of high prices of all kinds of agricultural produce prevailed, consequent on the French war, and (during a great part of the time) an inconvertible paper currency. I believe I am not far wrong in stating that during this period the rent of land doubled.

3rd. Seven years, from 1817 to 1822, during which prices, rapidly fell, notwithstanding a corn law intended to maintain wheat at 80s. per quarter. This relapse, consequent on the exhaustion caused by the long war, and the resumption of cash payments, reached its culminating point in 1822, when the price of produce fell fully 50 per cent. below its maximum ten years before. This was a period of great agricultural distress. Landlords struggled to maintain their advanced rents. Tenants were unable to pay them. The information at my command leads me to the conclusion that the fall of rent from its war maximum may be estimated at about 33 per cent.

4th. Twenty-six years, from 1823 to 1848, exhibiting a gradual recovery in the prosperity of the country and in the prices of produce, and a recovery of say 10 per cent. in rent.

5th. Four years, from 1849 to 1852, exhibiting a very low range of prices of all articles of agricultural produce, consequent on the repeal of the Corn Laws. Rents were generally reduced about 10 per cent. In some cases landowners were obliged to submit to a reduction of 15 to 20 per cent.

6th. Twenty years, from 1852 to 1872, during which an unexampled extension has taken place in trade and manufacture, and the consumption of all kinds of agricultural produce, has enormously increased. The price of corn has been kept down to nearly its previous average by foreign competition, but the prices of meat, stock, and dairy produce have advanced upwards of 50 per cent. The rent of dairy, grazing, and stock farms has advanced 33 per cent., and is now as high as it was during the French war. The rent of arable farms has advanced 10 to 20 per cent., but it has not generally reached the maximum attained during the war; nor is this surprising, when we recollect that during the twenty years, from 1800 to 1819, the price of wheat ruled more than 50 per cent. higher than it has ruled during the last twenty years. The present high prices of meat and dairy produce are no doubt mainly due to the increase of the population, and to the greatly increased consumption of the working classes, and also, though in a less degree, to decreased production caused by the droughts of 1868 and 1870.

It will be seen that during the period of a century and a half included in the foregoing pages, agriculture has had its ups and downs, its lights and shadows, its times of prosperity and adversity. The pages of contemporary writers are pregnant with allusions to periods of agricultural distress. Evelyn, in 1703, says, "Corn and provisions so cheape that the farmers are unable to pay their rents." "The Landholder's Companion," published in 1734, says,—"The interest of our British landowners has been declining several years last past; it has been a general observation that rents have been sinking, and tenants unable to make as good payments as formerly. . . . . Before farmers can pay their rents, wheat of middling goodness ought, I think, to sell for about 4s. 3d. per Winchester bushel, barley for 2s. 6d., and oats 1s. 6d. I know in former times less prices were sufficient; but as circumstances alter the same thing is altered; iron, timber, harvest people, and servants being much dearer than heretofore, corn farms will not yield sufficient profit to the occupiers of them, unless they can have such prices, particularly as cattle, sheep, pigs, butter, and cheese are now one-third part cheaper than formerly, and what is called a living price."

Arthur Young, writing in 1780, says,—"In the years 1776-77, prices fell considerably; and in 1779, so low that very general complaints have been heard of ruined farmers and distressed landlords; and at the time I am now writing, the fact holds that there is a considerable fall in all products, and great numbers of farmers ruined. I have the prices of wool for forty years now before me; and that which from 1758 to 1767 was from 18s. to 21s. a tod, is for 1779 only 12s., and was in 1778 but 14s. We must go back to 1754 to find a year so low as the last. Wheat and all sorts of grain are greatly fallen."

Some of our members have doubtless a personal recollection of the collapse of 1822. My own experience does not go back to that date, but I have a vivid remembrance of the difficulties attending the low prices of the years 1849 to 1852, and the anxieties of the land agent during that period.

It is, however, only by a comprehensive survey of a long course of years, that the broad facts can be ascertained and the results fully appreciated. Such a survey I have endeavoured to take in this paper, and if my statistics have been somewhat wearisome, I trust they have not been without interest, and that they will be useful and instructive for future reference.

The general result—the progress of a century—may thus be summed up: a rise of 25 per cent. in the price of wheat, notwithstanding an enormous foreign importation; of 46 per cent. in that of barley; of 33 per cent. in that of oats; of 140 per cent. in those of meat and dairy produce; of about 50 per cent. in that of labour; and of 200 to 250 per cent. in that of rent. It is beyond the scope of this paper to allude to the greatly increased produce of land during the same period, consequent on the improvements of modern agriculture, a subject well worthy of a paper from some member of our institution competent to do it justice.

With the aid of the light of the past, let us now turn our eyes for a few moments towards the future. It cannot be denied that a cloud looms on the horizon, franght with elements of anxiety, if not of danger: I allude to the labour question. Far be it from me to grudge the agricultural labourer a share in the general prosperity. It cannot be said that his condition has been satisfactory, whether as regards his wages or his habitation, and we must not be surprised at his endeavour to better himself. Labour, like other commodities, must in the long run be regulated by the law of supply and demand. Combination, for the purpose of reaping the benefit of an increased demand for labour is legitimate, and need not be feared were it conducted on fair and proper principles, with a board of conciliation and arbitration, to settle disputed questions without resort to the disastrous system of strikes. But, unfortunately, trade-unions are conducted in a manner utterly opposed to the principles of political economy, and to the interest of the capitalist and the working man. To say nothing of the attacks upon capital, the rules of the unions are destructive to the liberty of the artizan. All other classes in society have full scope for their energy, industry, and skill. The union forbids the strong, able-bodied, skilful man to benefit by his superior strength and skill, by limiting the amount of labour to constitute a fair day's work, that limit being measured by the capabilities of the weaker and less skilful hands. All are thus reduced to one dead level, and a loss is sustained both by the labourer and by the community at large. If similar principles are to be applied to agricultural labour, it is hard to see how farming operations are to be carried on, dependent as they are upon the weather, and requiring to be done precisely at the proper time. If the man is not left at liberty to make his own bargain with his master for piece-work, and if in the critical time of harvest the union is to dictate the price of harvest work, and to order a strike if its terms are not complied with, the position of the farmer will be anything but enviable. Let us hope that by reasonable and timely concession, the labourer may be deterred from submission to a bondage as hurtful to his own interest as to that of his employer.

What further advance may be realised is matter for speculation; but my impression is, that in the course of a year or two we shall see wages ranging from 15s. to 18s. per week, according to locality. It is to be hoped that higher wages and better food may tend to raise the labourer's physical powers, and that thus he may become worth his increased pay. Certain it is, that in those counties in which the highest scale of wages prevails, the men are superior in power and skill to those in the lower waged counties,—a difference partly due, perhaps, to race, but partly, no doubt, to better food. The use of agricultural machinery not only effects a direct saving in labour, but also acts, indirectly, in sharpening the wits and quickening the movements of the labourer. If the men have the good sense to avail themselves of these advantages, without submitting to union interference with freedom of contract, and dictation as to the price of piece-work and the hours of labour, not only will their condition be improved, but the farmer, though he may suffer some temporary loss and inconvenience, will, ultimately have no reason to regret the change. The landlord need fear no reduction of rent, except, perhaps, in the case of heavy clay farms. He will find it necessary to provide better cottages, as the condition of the labourer improves;

but, on the other hand, the labourer will be able to pay an increased rent, so as to afford a moderate per-centage on the outlay; thus, it may be hoped, that both landlord and tenant may learn,—

"Out of this nettle, danger,
To pluck the flower, safety."

We have seen the great increase in the value of agricultural produce, rent, and labour, that has taken place during the last century. Is this progressive increase likely to continue? The increase during the last century has not been exceptional; but it is a type of the gradual advance which has been silently but surely going on for centuries past. The same causes that have led to this advance,—increased population, increased demand, and, above all, increased amount of realised capital,—are still operating, and appear likely to operate with greater force than ever. The supply of money has increased, still increases, and will continue to increase, and its value; its purchasing power, will therefore continue to decrease. In other words, the prices of produce will continue to rise, with the exception of articles like wheat, which can be supplied in almost unlimited quantities. It may, I believe, be safely predicted that should our Institution exist and flourish, as we all hope it may, until 1972, the surveyor of that date, whose lot it may be to chronicle the progress of another century, will have to record an advance as great in the value of produce, rent, and labour, as that which I have endeavoured to lay before you.

After a few remarks from members the debate was adjourned to January 27th.

THE EDINBURGH HOSPITALS.*

THE financial history of George Heriot's Hospital is remarkable. Heriot, jeweller and goldsmith to James I. of England, died in 1624, and bequeathed the residue of his property, 23,625*l.*, to the erection of a hospital "for the mainetenance, reliefe, bringing upp, and education of poore fatherlesse boyes." The foundation stone was laid in 1628, but owing to the civil war the building was not opened till 1659, the cost having exceeded 30,000*l.* One hundred and eighty boys are maintained in the hospital, where they are taught, in addition to the ordinary branches of English education, French, Latin, and Greek, mathematics, drawing, vocal music, and dancing. Those who manifest talents, and a desire for the learned professions, are sent to the University of Edinburgh, with an allowance for four sessions of 30*l.* a year. Ten outdoor bursaries of 20*l.* a year are likewise bestowed on deserving students in the college. On leaving the hospital, the boys are provided with an outfit of clothes, and a suitable assortment of books. Such as are bound apprentices are allowed 50*l.*, in annual sums of 10*l.* during the five years of their apprenticeship, with a present, if merited, of 5*l.* for good behaviour at the end of their apprenticeship. Notwithstanding all this beneficent work, the governors find themselves in possession of large "surplus funds;" they are not quite as rich in money, it may be, as the governors of Christ's Hospital, or of Dulwich College, but they certainly seem as abundant in good works as either of those bodies. With their surplus funds, the governors of Heriot's Hospital are planting elementary free schools all over Edinburgh. They have already established thirteen of these schools,—eight juvenile and five infant. They are open, first, for the children, in poor circumstances, of deceased burgesses and freemen; second, for the children of burgesses and freemen who are unable to provide for their support; and third, for the children of poor citizens and inhabitants of Edinburgh residing within the boundaries of the city. The governors are empowered "to allow to any of the boys, in the course of their education at such schools, being sons of burgesses and freemen, such uniform fixed sum of money in lieu and place of maintenance, and such uniform fixed sum for apprentice-fee, after their education at the said schools is completed, as shall be determined." About 4,000 children are under instruction in these schools. The annual revenue of the hospital is about 16,000*l.*

The governors of George Heriot's Hospital, as has been seen, devote their attention to the provision of elementary free schools for the instruction of the children of the poor. Their labours in this direction have been attended with the most complete success. The good they have effected in the course of the last twenty years, and the knowledge and healthy influence they have diffused, are beyond conception. Other workers are occupying, worthily and successfully, another part of the educational field, in making provision of a superior middle-class education at moderate cost.

George Watson, accountant to the Bank of Scotland, who died in 1723, left 12,000*l.* to be invested and expended in much the same way and for the same objects as in the Heriot bequest. A hospital was built on "the Meadows," and opened in 1741. It had accommodation for from 90 to 100 boys, and that number was maintained in it. The youths brought up in George Watson's Hospital had an additional benefit conferred upon them, if deserving, in a sum of 50*l.* presented when they reached twenty-five years of age. A few years since the hospital and its grounds were bought for a site for the new Edinburgh Infirmary, and the administration of this hospital and other endowed institutions was remodelled, and, under the authority of a Provisional Order, which duly received Parliamentary sanction in 1870, their management was entrusted to the Edinburgh Merchant Company, in connexion with the Endowed Institutions (Scotland) Act.

The Merchant Company's Schools include,—1. The Edinburgh Educational Institution for Young Ladies. The course embraces all the branches taught in the best institutions and boarding-schools for young ladies, and includes French, German, and Latin, lectures on literature and science, algebra, mathematics, drawing, vocal music, instruction on the pianoforte, drill, calisthenics, dancing, and needlework. The fees for the entire course are from 12*s.* 6*d.* per quarter, in the elementary department, to 2*l.* 10*s.* for the advanced division of the senior department. 2. The George Watson's College Schools for young ladies, with a precisely similar course and the same fees as the preceding. 3. The George Watson's College Schools for Boys, in which a course is pursued that qualifies for commercial or professional life, the Civil service, or the universities. It embraces English, Latin, Greek, French, and German; in addition to ordinary branches,—algebra, mathematics, drawing, vocal music, botany, natural history, natural philosophy, chemistry, drill, gymnastics, fencing, and dancing. The fees for the course range from 10*s.* per quarter, for the elementary department, to 2*l.* 10*s.*, for the most advanced. 4. Daniel Stewart's Institution for Boys, in which the course and fees are the same as in the preceding; and 5. James Gillespie's Schools for Boys and Girls. These are primary schools, and profess to provide a superior education, the course including all the ordinary branches, with vocal music and drill, mechanical drawing being taught to the boys, and sewing and knitting to the girls. The fees are 3*s.*, 4*s.*, and 5*s.* per quarter, and 6*d.*, 9*d.*, and 1*s.* per quarter for writing-materials and the use of school-books.

The rewards at the disposal of the governors are numerous and valuable, including sixteen presentations to the foundations; 154 school bursaries, each of which respectively amounts to the cost of the successful competitor's school fees for session 1873-74; and six bursaries of 25*l.* a year, tenable for four years. The governors also award twelve free tickets for the class of Professor Hodgson, of Edinburgh University, on Commercial and Political Economy and Mercantile Law.

In connexion with the George Watson's College Schools, a large house has been recently purchased in Lauriston-lane, Edinburgh, and converted into school-rooms. It is adjacent to the present school-buildings, which were formerly known as the Merchant Maiden Hospital. The new acquisition was of three stories, to which a fourth has been added. The entrance is from the present school-ground, by a new doorway, leading into the new playground, which is 130 ft. by 100 ft. There is also a playroom, 30 ft. by 17 ft., and 20 ft. high, lighted from the roof. The new class-rooms are 20 ft. by 16 ft., and 18 ft. by 15 ft. two rooms on each of the floors, in addition to master's room, small class-rooms, another play-room, &c. The new upper floor is not divided, and gives a spacious room, 40 ft. long by 26 ft. wide. It has a lofty ceiling with two roof lights. It has also six lofty side-windows.

A spacious playground is attached, for the exclusive use of the elementary scholars, for whom a large hall for recreation is also provided.

The governors have also commenced the erection of a new lecture-hall, capable of accommodating 1,200, for the use of the senior pupils. It is in the Greek style, treated with something of the freedom of the Renaissance. It is 83 ft. long by 51 ft. wide, 42 ft. high to the cornice, and 62 ft. high to the top of the lantern-light. The added space will accommodate 808; but two other large rooms may be used with it, by the opening of sliding-doors.

When the additions have been completed, the accommodation and appliances of the George Watson's College Schools will be unsurpassed; and it is not to be wondered at that the applications for enrolment should be as numerous as the master and governors can desire, or that the utmost eagerness should be displayed to take advantage of provisions for a course of instruction and training of high order, at a cost little more than nominal.

* See p. 942, *ante*.

MEDIÆVAL ARCHITECTURE IN PARTICULAR DISTRICTS.

AT a recent meeting of the Architectural Association, the Prize Essay was read by its author, Mr. F. P. Johnson; the subject being "The Special Characteristics of Mediæval Gothic Architecture pertaining to Particular Districts of the United Kingdom." Of this essay we give a short abstract.

These special characteristics (said the author) may be traced to (1) foreign influence,—priests and nobles from different parts of the Continent at and after the Norman Conquest introducing the artists of other countries, features brought by missionary monks and caught up on travels to Rome by bishops, &c.; (2) individual taste,—determining the application of the special forms at any time generally prevalent, the influence of the personal preferences of certain leading original artists moulding for a time at least the architecture of considerable districts; and (3) the nature of the materials obtainable,—the power of obtaining without stint the very best materials of every sort, or, owing to difficulties of transport, restraint in the use of desirable materials, or even the restriction merely to those produced in the locality.

In the *Norman style*, many essential features appear which, though rare in Normandy (*a*), may be met with in Burgundy (*b*), Lorraine, the Netherlands (*c*), the Valley of the Rhine (*d*), and even in the north of Italy (*e*). The following are examples of the illustrations given by the essayist:—

(*a*) Of peculiar features common to Normandy and England (as one instance among many), the two aisles to the transept at Winchester are connected across the end (a somewhat similar arrangement occurs at Ely), also at St. George de Boscherville (near Rouen).

(*b*) At Gloucester Cathedral, the columns of the nave (not the arches), the columns of the chapter-house bearing the wall-arcade, together with contemporary works at Tewkesbury, Malvern, and Pershore, resemble in general character the Abbey of Tournus, in Burgundy. The chevet in St. Bartholomew the Great, London, is very similar to that of St. Menoux, near Moulins. The west doorway at Rochester, and others in Kent, and the Prior's Doorway at Ely,—without chevrons, but with signs of the zodiac and other designs in the arch-mouldings, vesica-piscis in the tympanum, with figures at the sides, have an almost exact counterpart in the west end of the Cathedral at Autun. Fragments at St. Benigne at Dijon, St. Ayoul at Provins, and the Church at Avallon, show also a similar style of decoration.

(*c*) The west front of Lincoln Cathedral (1073-94) is a screen, afterwards completed in a different manner, but probably in its original design similar to the screens at the west fronts of Belgian and North German churches at this date. The Abbey Church of St. Edmondsbury, Suffolk, is triapsidal, a common arrangement in Belgium and North Germany.

(*d*) At Waltham Abbey and Durham Cathedral,—at this period held conjointly,—the piers are alternated square (grouped) and round, and the vaulting was originally intended to be quadripartite,—one bay of the nave to two bays of the aisles,—as in the great cathedrals of Worms and Spires, in the Rhine Valley. The arched corbel-tables, supported at intervals by small columns, at Peterborough, and the continuous interlacing arcades, and numerous square and circular turrets there (also parts of the central tower at Norwich Cathedral), are suggestive of details at such churches as Rosheim and Marmoutier, in the southern portion of the Rhine Valley.

(*e*) At Worcester, in the nave, transept, and chapter-house, the Lombardic practice of working with two differently-coloured stones is very prominent.

In the Early English Style, the existence of several distinct schools of architecture may be traced,—such as (*a*) Canterbury (William of Sens, architect, 1174); (*b*) Winchester (Godfrey de Lucy, bishop, 1189); (*c*) Lincoln (Geoffrey de Noiers, architect, 1186); (*d*) Yorkshire (John de Eber, abbot of Fountains, 1204).

(*a*) After the destruction by fire of the choir at Canterbury, in 1174, William of Sens adapted the design of the choir of Sens Cathedral, in the erection of the choir now existing. Here hexapartite vaulting springing from the level of the triforium capitals, stilted arches, the breaking off of the vaulting shafts on a line with the capitals of the

main piers, and the general character and arrangement of the carving of these capitals, are special features new in England. At Rochester are displayed some of the peculiarities of the work of William of Sens; and in the presbytery of Chichester Cathedral, though the mouldings are purely Early English, the forms of the arches and the arrangement of the capitals and vaulting-shafts bear resemblance to Canterbury. At Westminster Abbey, St. Mary Overy, Stone Church, Kent, a similar foreign influence appears in the carving: the dog-tooth is scarcely to be met with in these churches. The spandrels of the chancel arcade of Stone Church, with the few carved ones at Westminster, may be compared with those in the triforium at Le Mans Cathedral, or the arcade behind the stalls at Notre Dame, Paris. The apse at Westminster is a counterpart of that at Souvigny, near Moulins (Bourbonois).

(*b*) The features of the design of the presbytery and Lady-chapel of Winchester Cathedral (1189-1204) cannot have been borrowed from those at Canterbury. These features comprise predilection for moulded work instead of carved, the use of slender shafts standing alone, the arcading of the walls externally and internally, &c. At Salisbury Cathedral (1220-1258), the capitals are moulded throughout, with the exception of those of the vaulting-shafts. Slender detached shafts appear in the upper windows at the ends of the transepts, and still more strikingly in the Lady-chapel [36 diameters high]. At Worcester, the shafts are more detached than those at Salisbury, being secured with metal rings instead of stone bands. At York, the translation of Bishop Walter Gray from Worcester, in 1216, may have led to an imitation of some of the details of that cathedral (as in capitals, shafts, &c.). The Chapel of the Nine Altars, at Durham, has some characteristics of this school of Early English work.

(*c*) Geoffry de Noiers was probably not a foreigner, like William of Sens, but an Englishman by birth and education. In his work, carried on at the choir and eastern transept of Lincoln from 1186, under the patronage of St. Hugh of Grenoble, appear numerous special characteristics. Native oolite is used for some detached shafts (as well as Purbeck marble). We have also gabled buttresses, double arcades in many parts of the interior,—concave hexagonal shafts, in some cases with upright rows of crockets behind them. Some of these peculiarities, slightly modified, appear in the nave and its aisles, a few years later in date; and in the works of the district round: for instance, polygonal shafts are common in the Northamptonshire and Lincolnshire churches of this period, and at Brington, and Harleston, in Northamptonshire, they have concave sides.

(*d*) In Yorkshire, a preference is shown for moulded work for a somewhat sparing use of detached shafts, for the use of the dog-tooth, as almost the only enrichment; and large rose-windows are frequently introduced in the spandrels of gables (York, Durham, Beverley commenced in the western façades at Byland and Kirkstall).

(*e*) In the Scottish works of this period, the mouldings are, if possible, more severe than those of the Yorkshire masons; the doorways have widely-splayed jambs, with two rows of columns on each side, one behind and between the other; three flattened gables (as in the west front at Ripon) usually cover the centre doorway. At Jedburgh and Dryburgh, the clearstories are continuous, similar to those in the transept of York Cathedral, and the choir at Whitby. Scottish ecclesiastical buildings of this date resemble indeed in the main English designs.

In the *Decorated period* the general adoption of tracery throughout the country, about 1260 to 1270, was a decided step towards complete unification of style throughout the country. Local peculiarities may, however, be noted in the use of tracery, *e.g.*:—

(*a*) In the choir-screen, by Prior D'Estre (1304-5), window in St. Anselm's Chapel, at Canterbury Cathedral; the tower of Herne Church, Kent; and the chancel of Chartham Church, Kent, the treatment of the cusping is peculiar and indicative of connexion between the designs.

(*b*) The use of the ball-flower, carried to profusion in the central tower of Hereford Cathedral, was an innovation supposed to have been started in Oxford by the architects of the chapels of Merton and Gloucester Colleges. In the south aisle of Gloucester Abbey (reconstructed 1318) the windows have sixteen ranks of this enrichment on each side. The churches of Badgworth (Gloucestershire), Leominster, and Ledbury, Herefordshire, and the reredos at Exeter, may also be mentioned.

(*c*) The choir of Wells Cathedral (1309-29) has examples of the open-panelled parapets and square angle-turrets, which afterwards became general in the western counties.

(*d*) Tracery was introduced in the north of England in rebuilding St. Mary's Abbey, York, under Abbot Simon (1259-99). From this date the architecture of this part of the island lost almost all the individuality of its style.

In the *Perpendicular period*, beginning about the middle of the fourteenth century, any broad local characteristics due to individual taste are less prominent, though many minor details show personal influence or local custom; indeed, apart from a few, comparatively speaking, unimportant peculiarities, the Perpendicular style is the same all over the kingdom, and being strictly peculiar to this country, is properly called a national style. With respect to the influence of materials, the essayist notices the round towers of Norfolk and Suffolk, attributed to the want of good stone for the quoins; also the use of cut flints in surface decoration, as in the gateway at Norwich, and the priory church at Walsingham, &c.; the special character resulting from the use of Roman bricks, as at St. Alban's and Colchester. The early revival of brick architecture in Essex, Kent, and Sussex, also probably due to the want of building stone. The special excellence of the wood roofs and screens of Norfolk may also have resulted from an enforced study of the application of woodwork; as well as the porches of Essex, as at Oldham and Bramwell; the wooden towers of Essex and Suffolk; and the wooden spires of Surrey and Sussex.

DAIRIES AND DAIRY MANAGEMENT.

A REGULAR and easily-regulated temperature is of great importance. Hence the dairy should face north, and be sheltered from the south. It must be well ventilated. This can be secured by carrying the walls up, introducing under the ceiling a row of ventilating bricks, and having the space occupied by the movable casement covered with perforated zinc. We thus keep the temperature equable in summer, and in winter a hot-water apparatus, with circulating pipes, secures the requisite warmth. A dry atmosphere is desirable: hence sinking the dairy beneath the surface, thereby insuring dampness, is not recommended, although often done. We should prefer taking the ground level, building the walls with a damp-course, and laying the floor, which should either be flags or brick squares, on concrete.

Touching dairies and dairy work, the *Field* has lately given some useful particulars, which we quote. A good drain round the building is desirable. If the bricks are machine-made, and sufficiently even to make a good face, we should make the walls 14 in. wide, with a hollow space of 4½ in. inside, and point both inside and out; we thus avoid the necessity for plaster, which takes a long time to dry, and until dry is likely to affect the milk. Three coats of Carson's iron paint makes a good finish inside, filling up all spaces in the bricks and leaving a surface that can be easily cleaned, and on which nothing offensive can lodge. It should always be remembered that milk is subject to fermentation, and that it turns sour rapidly: hence, both in the dairy fittings and utensils we should have surfaces into which moisture cannot soak. Where outlay is no object, the walls are often covered with glazed tiles, which look remarkably well, and are easily cleaned. The glazing must be well done, otherwise there will be risks even with them, and we prefer painted walls as infinitely cheaper. The shelves or dressers on which the milk-bowls stand may be either of slate or wood. We much prefer the former; but if the latter are adopted on the score of economy, Dr. Vœlcker's advice as to paint is excellent, as we thereby prevent milk accidentally spilt being absorbed by the wood. Three coats of the best white paint, and this renewed frequently, will answer the purpose. Slate looks very neat, and is easily cleaned, but the slates must be in one piece, and not jointed, or only in such a manner that the joints are moisture-proof.

We have said that the walls should be high, the roof covered with red tiles if straw cannot be used; the latter insures the most even temperature, and is the coolest in summer. Black slates should be avoided, or, if they must be used, straw should be packed underneath; but this is objectionable, as harbouring rats and mice. We have a considerable choice of vessels. Slate cisterns can be recommended only when cut out of the solid block; they are then non-absorbent, and readily cleaned. If jointed, as is often the case, the milk is absorbed by the cement, and will not keep. Glazed earthenware pans are cheap, and answer well, provided the glaze is even and good. Unglazed pans or vessels of wood are most objectionable for reasons stated; glass is clean but liable to break. Dr. Vœlcker refers favourably to the tinned iron vessels shown by Major Cassander, at the Exhibition of 1862. These vessels have a small opening at the bottom, fitted with a brass plug; over the opening a cylindrical tube, provided with narrow slits, is soldered. When the plug is raised the skim milk escapes, leaving the thick cream, which cannot pass through the narrow openings at the bottom of the pan. They should not exceed 2½ in. in depth, as a loss of cream ensues if the milk stands in a deeper vessel. Another advantage in using shallow metal vessels is, that the temperature of the milk is more rapidly reduced, especially if the vessels stand upon slate or stone shelves. It is very important that this reduction of temperature, say 90 deg., at which it comes from the cow, to about 60 deg., should be as rapid as possible. Dr. Vœlcker believes that in a proper dairy twenty-four hours is sufficient time to leave the cream to rise, and he quotes an experiment of Sannert's in proof. He left two equal quantities of milk, the one for thirty, the other for sixty hours before skimming; the former produced 30lb. of butter, the latter only 27lb. Mr. Horsfall, whose papers on "Dairy Husbandry," first published in the journals of the Royal Agricultural Society, are valuable, gives the following description of his own dairy:—

"Dimensions, 6 ft. wide, by 15 ft. long, and 12 ft. high. At one end (to the north) is a trellis window; at the other an inner door, which opens into the kitchen. There is another door near to this which opens into the churning-room, having also a northern aspect. Both doors are near the south end of the dairy. Along each side and the north end two shelves of wood are fixed to the wall, the one 15 in. above the other; 2 ft. higher is another shelf, somewhat narrower but of the same length, which is covered with charcoal, whose properties as a deodoriser are sufficiently established. The lower shelves being 2 ft. 3 in. wide, the interval or passage between is only 1 ft. 6 in. On each tier of shelves is a shallow wooden cistern, lined with thin sheet-lead, having a rim at the edges 3 in. high. These cisterns incline downwards slightly towards the window, and contain water to the depth of 3 in. At the end nearest the kitchen each tier of cisterns is supplied with two taps, one for cold water in summer, the other with hot for winter use. At the end next the north window is a plug or hollow tube, with holes perforated at such an elevation as to take the water before it flows over the cistern."

In summer the kitchen door is closed, and an additional door fixed, the space between being well packed with straw; a curtain of calico, kept moist with salt and water, is hung up before the window. The water in the cisterns is so arranged as to trickle slowly through all the time, and thus the temperature is reduced and the milk remains sweet. In order to reduce the temperature of the cream so as to insure firm butter, Mr. Horsfall hit upon a simple and successful plan, viz., to lower the cream about 28 ft. down a well, and leave it there the night before churning. He had a windlass made for this purpose, and the cream-jar placed in a basket suspended from the rope. So great is the advantage thus acquired that sooner than be without it, Mr. Horsfall would go to the expense of sinking a well. We mention this fact as important to bear in mind in constructing a new dairy. A supply of good water is essential, and it would be easy to sink the well either under or adjoining the dairy, so as to be within reach. Scrupulous cleanliness is necessary, but this rather by the keeping out dirt than by the constant use of water. All vessels must be scalded out immediately after using, the walls, floors, and dressers wiped over with a damp cloth, and speedily dried. Nothing is so injurious to the keeping of milk as a damp atmosphere. The atmosphere should be sweet; bad smells from accumulation of manure, cesspools, &c., are very injurious, and should be guarded against in the choice of a site.

"THE HITCH IN SANITARY REFORM."

SIR,—An article bearing the above title, which appears in the last number of the *Builder*, touches upon such an important topic, and opens out such a pitiable state of things in connexion with it, that I trust I may not be the only one of your readers who will be ready to aid in its useful discussion.

It is really deplorable to find, that in addition to the fact of only a fraction of the Public Health Bill of 1872 having been passed, there is every probability of even that fraction being rendered inoperative, or, at least, greatly stinted in its practical and immediate utility, through the apathy of the Public Health Department, on the one hand, and the interposition of petty professional differences, on the other. I regret that I have not had an opportunity of reading a full report of the proceedings in connexion with the recent deputation to Mr. Stansfeld; but from your remarks on the subject it is evident that they were little calculated to promote the object which all sanitarians alike, medical men and engineers, must or ought to have at heart.

In reviewing the position which the question of sanitary reform at present occupies in England, the most superficial observer cannot fail to notice how large a proportion the recent enactment, limited though it be, bears to the whole active legislation we have had on the subject. It is true that former Health Acts laid the groundwork for the more comprehensive Act we have so long been waiting for; but the circumstances out of which most of those previous Acts arose,—hasty efforts to quell rising or expected epidemics,—rendered their operation more tentative than must be the case with an Act passed now, after all our dearly-bought experience in the details of sanitary requirements since the period

when the question first came to the front. With the advantage of this large amount of experience, not only of the actual requirements to be fulfilled, but also in the many shortcomings of the means hitherto adopted, what is there to prevent the immediate commencement of efficient action, even though only on the basis of the apparently unappreciated Act passed last session? Shorn of its details though it be, that Act provides for the organisation of the necessary local authorities, and appointment of their executive officials, medical and engineering, and defines in some measure the degree of central supervision which is to be exercised over them. It also provides for the payment of half of the salaries of the local sanitary officials out of the imperial revenue in those cases where the locally-constituted authorities are not bigoted and vain enough to suppose themselves able to cope with dirt, disease, and death, in entire independence of central instruction and control.

Now do we find that these provisions are being availed of in such a manner and to such an extent as the intent and spirit of the Act presupposes? After all the agitation which preceded the introduction of the Bill, and all the discontent which manifested itself when the proposed Act was obliged to be clipped of its details, one would have supposed that, acting upon the principle best expressed by the adage, "Half a loaf is better than no bread," the town and rural district authorities would have created such a stir as had never before been witnessed in a similar cause. It would be supposed that the health authorities would have eagerly availed themselves of the means afforded them by the consolidation of all previous legislation into one comparatively simple enactment, providing unprecedented facilities for the appointment of medical and engineering officials of high talent, to set their respective houses in order. But, giving all due credit to those towns who have so far been wise enough to do so, it must be confessed that their name is far from legion; for in a far greater number of cases valuable time has been frittered away in acrimonious and deadening discussion; while in a still larger number of cases scarcely anything whatever has been done, the authorities seeming content to let matters slide on in their primitive, humdrum fashion, to the end of the chapter.

This is far from an encouraging aspect of the state of sanitary reform, but no good can possibly come of closing our eyes to the actual facts of the case, and that these are as represented I am confident will be confirmed by others who take up the lance in this cause. England, above all other countries, should be active in the furtherance of these measures, for she has hitherto led the way in their prosecution, and is even now on the point of being used as a model in the framing of the new Public Health Bill of Prussia,—one of the greatest sanitary authorities of that kingdom, Dr. Varrentrapp, having been commissioned to report as to the provisions to be contained in that Bill.

Your remarks as to the means for the proper combating and dispersion of sanitary evils are well worthy of the earnest consideration of the Minister of Public Health, in whom is vested a responsibility greater than that held by the commander-in-chief of an army, inasmuch as the health, and consequently the lives, of the entire nation are placed under his supervision. And I venture to predict that it will be a bad day for sanitary reform when active and efficient central supervision is withdrawn from the proceedings of the local authority. Local government,—an excellent principle in itself,—carried to the extent of absolute authority, is worse than the old French system of absolute central power; and it is especially in the selection and appointment of local officials where the central authority should exercise an approving and ratifying influence. Far too little attention has hitherto been paid to the qualifications of local officials, who are in many instances appointed in utter disregard of the duties they ought to perform. The office of sanitary inspector, which ought now to become an important office, either in connexion with or immediately under the control of the engineer of the town or district, is, in too many cases, deputed to persons who are ready, for a low rate of remuneration, to fill the post, but whose training and qualifications are far from being such as to fit them for the discharge of the detecting and remedial duties of such an office. Hence the discreditable state of the sanitary *details* of many towns, which, perhaps, pride themselves upon possessing a well-organised and zealous sanitary staff. A higher scale of remuneration, coupled with a more searching examination of a candidate's previous training, and of the nature of the posts he has already filled, would secure the appointment of a much higher class of public engineering officials than is at present the case.

With regard to medical officials,—the light cavalry, as you properly designate them,—there is not nearly so much difficulty in obtaining talented aid, as the medical officer will, in the great majority of cases, be a practitioner in the district for which he is appointed, having daily opportunities in his practice of becoming intimately acquainted with the sanitary condition of the population, and of reporting from time to time, at stated periods or otherwise, thereon. He would thus work in harmony with the engineering officials, and especially with the sanitary inspector, who should be a man having preferably a sound engineering education, and be especially accustomed to the detection and removal of the class of evils popularly known as nuisances. With officials of this standing, possessing not only professional ability, but also professional zeal, and placed under the supervision of a central authority more disposed to guide and instruct than to command, but with full powers for independent action whenever necessary, sanitary reform would rise triumphant from the bog of petty discord into which it seems falling, and we should at last be on the road to the accomplishment of the object which we have so long been bent on attaining.

As to further legislative powers, it will be well to bear in mind the opinion of an authority like Dr. Acland, who recently expressed a hope that the passing of the complete Sanitary Act might be delayed a session or two, so as to afford time for the development of the leading principles involved in the Act already passed. It behoves all local authorities, therefore, to avail themselves of this breathing-time to the best advantage, by using to the utmost and to the best purpose the powers already available, and thus qualify themselves to be heard when the more detailed Bill is brought forward. This they can only do by the immediate appointment of the necessary talented officials, and by modestly placing them and their own deliberations under the eye of the Health Department and its minister, in conformity with the spirit of the Act.

The Health Department must also do its duty fairly and effectually, by exercising its most extensive powers with discretion and firmness, and thus ensure to the nation the fullest and immediate advantage of the aids which past experience and modern knowledge can bring to bear upon the vital questions entrusted by the nation to their superior care. SANITARIAN.

DAMAGES FROM THE RECENT GALE.

CONSIDERABLE damage has been caused by the violent gale of Sunday night last in the south-western suburbs of London. At Richmond a brick wall, 9 ft. high, of over 100 ft. in length, situate at the side of the road leading from Warple-way to King-street, belonging to Mr. Sims, a builder, was blown down across the footpath, and a large quantity of hoarding, 12 ft. to 14 ft. high, adjoining the railway-station yard, was blown completely across the high road to the new station-yard. Some trees in Richmond Park were uprooted. At Twickenham the south side of a brick-and-tile-built cottage, which was fortunately "to let," situate near Railway Junction, was blown in, the *débris* falling through the ceiling of the upper rooms on to the floor. At Staines a portion of the roof of a house, belonging to Mr. Denyer, was blown off. At Brentford several of the old houses, situated by the river side, were much damaged.

A large building in Bermondsey, which was being erected for business purposes, was so shattered by the wind that it will have to be rebuilt. In fact, in all parts of London the damage has been more or less severe.

The gale was nowhere felt with greater severity than at the Crystal Palace, but the building remained firm, and (with the exception of a few squares of glass) uninjured.

At Ramsgate, the most serious part of the damage occurred at the Granville Farm, the property of Mr. Welby Pugin. The farm buildings, which stand near the Granville Hotel, comprise a long range of stabling. About seven o'clock in the evening, when the gale was at its height, the wind uplifted about 80 ft. of the slated roof, and carried it several feet northwards, tearing away a considerable portion of the brickwork. Some men and horses had a narrow escape.

Considerable damage has been done in various parts of the city of Oxford. At Oriel College the wall and pinnacles of the chapel were blown down, and at the Great Western Railway the new goods station in the course of erection was completely wrecked. In innumerable instances the hoardings erected around buildings have been blown down. Great fears were entertained that the spire of All Saints' Church, which is now being taken down, having been declared unsafe, would not escape, but with the exception of the displacement of a few loose stones it withstood the gale.

One of the pinnacles of St. John's College Chapel, Cambridge, was blown down, within a few feet of the street, and the stone (weighing about 2 cwt.) was embedded in the earth. Similar damage was sustained by New Court, of the same college. The gable-end of a house was blown in in Barnwell, without doing any personal injury.

In Bristol, houses were blown down, scaffolding of new buildings was hurled across the streets, church pinnacles were carried through the roofs, and the top portions of private dwellings were either blown away or carried down through the roofs, inflicting upon the inmates serious injuries, and in some cases resulting in loss of life. The most serious calamity was caused by the wind forcing in the roof of a dwelling-house in Trenchard-street, by which two persons lost their lives, and a third was dangerously injured. The immense carriage factory of Rogers & Co., in College-place, near Brandon-hill, has been almost wholly destroyed, and the loss is estimated at about 3,000*l*. At Christ Church, Clifton, one of the massive pinnacles falling through the roof, above the organ-gallery, did damage to the extent of about 600*l*. Pinnacles of other churches were also blown down, but the damage was not so extensive as in this last case.

At Exeter, three pinnacles of the tower of St. Thomas's Church have been blown off amid a severe gale of wind and rain. One of the pinnacles fell on the roof, which it smashed in, and caused a large quantity of the ceiling to fall on children and other people assembled at divine service. The congregation hurriedly left the church.

At Cork the storm was terrific, and was accompanied with thunder and lightning. Glass in private houses was smashed, and part of the roof of the new granary belonging to Victoria Docks, Passage West, was blown away. Great loss of property is reported, but no loss of life as yet.

DARLINGTON INFECTIOUS DISEASES HOSPITAL.

THE foundation-stone of the proposed Infectious Diseases Hospital at Darlington has been laid by the Mayor (Mr. C. Ianson). The building will be situated a little back from the Yarm-road, opposite the workhouse, and approached by Hounden's-lane. The front will face the south, the length being 248 ft., the extent of the building backwards 192 ft. The site contains two acres of land. The pavilions or wards for the different diseases are apart from each other, but connected by a corridor. The pavilion for cases of small-pox will be at the west end of the structure, and will contain fourteen beds, twelve being for ordinary cases, and two for special cases requiring separation. The pavilion consists of two stories, the upper being for males and the lower for females. The enteric fever pavilion will be placed about the centre of the building, and divided in the same manner as the small-pox ward. The scarlatina ward is to be at the north-east angle, and will contain twelve beds—six for females, and six for males. At the south-east end, adjoining the scarlatina pavilion, will be erected a ward for special separation cases, and it will contain four beds. Each patient will be provided with 2,000 cubic feet, or 144 superficial feet, of air, in accordance with the requirements of the Medical Department of the Local Government Board. The administrative department is sufficiently large to accommodate a staff capable of working the hospital if extended to double its present size, apartments for a resident surgeon, matron, and porter being provided. In connexion with each pavilion will be a room for the nurse, with a window looking in upon the patients. The separation case rooms are provided with glass doors.

The material of which the building will be

constructed is brick, relieved by stone dressings. The ordinary open fire-places will be used for heating the wards.

The architect from whose plans the hospital will be erected is Mr. G. G. Hoskins, of Darlington; and the contracts have been let to the following:—Excavating, brickwork, stonework, and plastering, Messrs. M. Watson & Son; carpenter and joiner, Mr. T. Snaith; slating, Messrs. J. Atkinson & Son; plumbing and glazing, Messrs. Russell & Co.; painting, Mr. W. Dryden. It is expected that the building will be completed in about eighteen months.

In a town of similar size to Darlington, in the West of England, Mr. Backhouse said on the occasion, the people commenced to build a hospital for forty beds, at a cost of 20,000*l.*; while they at Darlington contemplated building a hospital for forty-four beds, which would only cost 9,000*l.* or 10,000*l.* It was absolutely essential that when they were building a hospital of that kind, they should meet all the requirements of the present day, and erect it according to the scientific medical knowledge of the day.

MIDDLETON BRANCH OF THE UNION BANK OF MANCHESTER, LIMITED.

The directors of the Union Bank of Manchester have for some time past sought to add to the convenience of their clients by opening various branch banks in towns around the head-quarters. A few years ago they purchased some property in the Market-place, Middleton, and in it established one of these branch banks, subsequently altering and re-adapting the premises, to make them more convenient. The alterations consisted in removing the lower portion of the elevation fronting the Market-place; and substituting in its stead a dado of Yorkshire pierpoint stone, having a moulded cornice, that also forms the sill for an arcade of windows above, and which have columns, caps, label-mould, and arches (with semicircular intrados and pointed extrados) of polished Yorkshire stone. At each intersection and extremity of the label-mould of this arcade is an escutcheon carved with the armorial bearings of one of the Lancashire towns in which the Union Bank of Manchester has establishments, viz., Manchester, Salford, Bolton, Oldham, Middleton, Royton, and Tyldesley. To the entrance-hall, the arch of the doorway corresponds with the arcade of the windows; the floor is laid with encaustic tiles, having on them in yellow letters in the centre, "Union Bank of Manchester, Limited," upon a chocolate ground, surrounded with a bordering in various colours; glazed swing-doors lead through a vestibule into the telling-room, and there is also a glazed screen and door separating the business portion from the residence of the local manager.

The improvements have been designed and supervised by Mr. James Redford, of Manchester, architect; and have been satisfactorily carried out by Mr. John Grundy, stonemason, as general contractor; with Messrs. Turner for carpenters and joiners; Mr. Ogden, bricklayer; Mr. Dean, plumber, glazier, &c.; and Mr. Fitzgerald, plasterer; all of whom belong to the district.

ALL SAINTS', STAUNTON.

The Church of All Saints, Staunton, in the Forest of Dean, has been re-opened for divine service, after considerable works of restoration, both externally and internally. The portions now remaining of the old church are certain portions of the arcades, which are of Norman date; the rest of these arcades of the succeeding transitional period, the arches being pointed; and the base and first stage of the Norman tower. No remains of the foundations of the north and south walls of the ancient aisles were found during the excavations, and there are not any indications of the existence of Norman work visible in the chancel, which is now of Decorated work. During the later periods demolitions and alterations have been perpetrated, until at length the fabric assumed the form of a nave, with a south aisle absorbing the transept, and with a continuous roof from west to east. The north aisle was swept away, with the exception of 17 ft. of its length, which, however, like the south aisle, has been thrown into the north transept.

The works of restoration,—commenced ten years since upon the chancel, which was then partially put in order,—have now been followed by a new open roof upon the nave; the old oak roof upon the south aisle proper has been opened out, the roof of the south transept has been placed in its position, and the south gable, with three-light decorated window (hitherto in the east wall), has been rebuilt. The porch has been newly roofed; all the old rotten plaster has been taken out, and the walls made good; the old pews have been replaced by new open benches of red deal; the organ is placed in the remaining portion of the north aisle; a prayer-desk and lectern of walnut-wood stand in the two eastern angles of the nave; the north transept is now the vestry; the windows are newly glazed; and the floors are all paved with Godwin's tiles.

The architect employed was Mr. J. W. Hugall, of Oxford; and Messrs. Wall & Hook, of Brimscombe, were the contractors.

Many years since, at a depth of 7 ft. below the level of the churchyard, a remarkable font was found: it is rectangular in form, being 2 ft. 5 in. high, and 1 ft. 9 in. in diameter. It has very little ornamentation, the side having two triangular forms, 9 in. long approaching each other. There is not any base. The upper member, which is 9½ in. high, consists of three very depressed circular mouldings and a line of beading. This font has staple-holes on two sides. There is a drain in the centre of the bowl, which is roughly hewn out, and the upper edge is much broken. It is now placed in the south transept for preservation. We cannot ascribe it to any other than the Saxon period, for it is entirely unlike any Norman font, and bears upon it the impress of an earlier origin.

THE GREEK CHURCH AT WOLVERHAMPTON.

To the small number of places in England which has a Greek church Wolverhampton has been added, the only other towns out of London (in which there are two) where a building for the celebration of the worship of that Church exists being Liverpool and Manchester. The structure which has been opened is a very humble one, having been built upon a small scale by the Primitive Methodists. It is, however, of sufficient dimensions to accommodate the anticipated congregation of Greek Church worshippers, who are not expected to number more than fifteen. The church owes its origin to the zeal of an English convert,—Mr. G. W. Hatherly,—who at one time was organist at Tettenhall Church. After his conversion, he advertised for any fellow-believers residing in the district, was written to by Mr. A. J. Caddo, the Greek consul at Birmingham, and a movement commenced which resulted in Mr. Hatherly becoming first, deacon, then priest, to minister in the adopted building in the Waterloo-road, Wolverhampton. The peculiarity about minister and building is that Mr. Hatherly is the first Englishman made a priest of the Greek Church, and the building just opened is the first in which the service of that Church has ever been said or sung in English.

The interior is as plain and as simple as the outside of the building—small, square, the walls plainly coloured, plain windows with stained glass borders, and the boarded floor covered with cocoa-nut matting, with a few forms on the right and left respectively for males and females, the sexes being kept separate in Greek churches. The larger portion of the floor before the eastern side of the church is left vacant, and at that side part of the floor is raised, gaily carpeted, and upon this daïs is placed the Iconastasis, or place of pictures. It is a screen upon which are hung three pictures. The centre one is placed so high as not easily to be seen from the floor; that on the right is a full-length figure of the Saviour, the head surrounded by a halo, having within its circle an inscription in Greek. On the left is a copy of the picture of the Virgin and Child in the Razan Church at St. Petersburg, the complexion of mother and child being more swarthy than would be conceived by an English painter, and the effect of the whole being strange and uncouth. On each side of the Iconastasis and the daïs on which it stands is an open screen of stained wood also hung with pictures. One bears the representation of the patron saint of the Church, the prophet Elijah. The artistic figure and drapery are marred by a glaring background of gold. The principal picture on the other screen is said to be a portrait of St. Nicholas; but, with the exception of the hands and face, it is wholly covered by a massive silver plate, of a rude style of art, the effect being anything but pleasing. Two other pictures on this screen represent—one the Baptism of Christ, the other his descent into Hades. The Iconastasis itself serves the purpose of the veil of the Jewish temple, and conceals the most holy place, into which the priest only is permitted to pass by the sacred doors, and that only at certain times and on particular occasions. Within the doors of the Iconastasis the greater portion of the ceremony of consecrating the church was performed, the doors being closed and the performers invisible. In the reading of divine service, the officiating priests were as gorgeously arrayed as Roman Catholic priests at High Mass. The service was a lengthy one, and had to be conducted by the priest fasting.

For these particulars we are indebted to the *Staffordshire Advertiser*.

THE ROTHERHITHE NEW INFIRMARY

The Local Government Board and the St. Olave's guardians have for some time been at issue respecting the building of a new infirmary at Rotherhithe. The Local Government Board requested the guardians to erect an infirmary distinct from the workhouse, which the guardians opposed on the ground of expense, but expressed their willingness to build one attached to the present workhouse.

At the meeting of the guardians held last week, a communication was received from the Local Government Board to the effect that the plan as suggested by the guardians would be sufficient, but that immediate steps must be taken for the building being at once proceeded with, or the Board would have to adopt a more peremptory method to compel them to do so. In deference to this decided intimation from the central authority, the guardians resolved that plans should be at once prepared for the erection of the new building.

NEW OFFICES FOR THE HOLBORN BOARD OF WORKS.

The Holborn Board of Works have taken a lease of premises in Little James-street, Bedford-row, for twenty-one years, at a rental of 190*l.* a year, which they are about to convert into a new board-room and offices, together with a large hall for holding public meetings in connexion with the district. At the present time there is no public hall in the district in which such meetings can be held. The lower portion of the building is intended to be utilised for the works department, by which a saving to the parish will be effected.

THE NEW CIVIL SERVICE CO-OPERATIVE STORE BUILDINGS.

The large and prominent block of buildings now in course of erection at the western angle of Queen Victoria-street and Bennet's-hill, for the Civil Service Supply Association, is now so far externally completed as to be ready for covering in. The building consists of two principal elevations, the chief façade being the Queen Victoria-street frontage, which is 63 ft. in length and 61 ft. in height from the street level to the top of the cornice, and contains three stories, besides the ground floor and basement. The ground-floor of this frontage, up to the window-sills of the first story, is built with Portland stone. On each side there are spacious entrances, pediment-headed, with trusses on either side of the doors and granite bases, whilst over the three windows in this part of the elevation there are massive carved figure-heads. The rest of the elevation is of Bath stone, there being five large and handsome windows in each story. Moulded pilasters with Corinthian capitals rise from the bottom of the first to the top of the second story windows, with panels over the windows of the first story, the second story windows being segment-headed. Over the last-named story is a band or string course, and above this the third story, having double semi-headed windows, between which are cast-iron columns, the elevation being surmounted by a moulded cornice, supported by consoles. The whole of the windows in the elevation will be glazed with plate glass. The return frontage in Bennet's-hill extends 107 ft. in depth from the Queen Victoria-street elevation, with which it is uniform both in design and

material to the extent of 42 ft., consisting of Portland and Bath stone, the rest of the elevation, to the extreme rear of the building, being of malm brick, with Suffolk stone dressings and moulded quoins, the windows being also uniform with those in the other portions of the structure. In this elevation there are three entrances, two being intended for the admission of goods, and the third a private entrance. The apartments in the interior of the building are very spacious. The basement will be exclusively set apart for stores and goods of different descriptions, whilst the ground-floor and the first and second stories will be appropriated for the sale of the various articles in which the association intend to deal. The principal sale-room on the ground floor, and those on the first and second stories, which will be approached by a spacious stone staircase, 11 ft. in width, are of large dimensions, being 62 ft. in length by 52 ft. in width, at the rear of which there are also other sale-rooms, each 49 ft. by 35 ft. The apartments in the third story will be exclusively set apart for the executive business of the association and domestic purposes, and will contain the board-room, committee-room, and offices, together with the housekeeper's rooms, kitchen, and other conveniences. In the basement of the building, at the rear of the Bennet's-hill frontage, there are two lifts for the raising and lowering of goods from the ground-floor to the second story. The windows on the ground-floor of the building will all be fitted with iron shutters. The estimated cost of the building, exclusive of the land, which covers an area of about 6,000 square feet, is 20,000*l*. The architect is Mr. E. Saunders, and the contractor Mr. Brass, Mr. J. Barnes acting as clerk of works.

THE ROMAN BATH IN THE STRAND.

IT is well worth remembering that, close to the busiest part of modern London, is to be found one of the earliest remains of Roman construction in the metropolis. A hundred yards down Strand-lane, close to the Strand Theatre, is to be found a bath constructed some 1,800 years ago, in which the water is now flowing as freshly and as freely as it did at that time. It is capital water, and King's College and other establishments in the neighbourhood are supplied from this source, which is constant and unvaried. At a guess the bath is about 14 ft. long and 6 ft. wide, rounded at the west end of it where the water is deepest,—say 4 ft., the bottom shelving towards the other end. It is at the deepest end that the spring rises, and the water is so plentiful, probably supplied by the Highgate hills, that it runs away at the rate of about 10 tons per day. As it runs, however, it passes, before going into the Thames, into an adjacent cold plunge-bath, which thus has a continual change of water for bathers. This latter bath, too, has a story, for it is said to have been formed by the Earl of Essex, Queen Elizabeth's favourite, from whose mansion here a neighbouring street is named. The house, however, we are disposed to think, must have been at some distance from this bath.

The sides of the more ancient bath are formed mainly of thin bricks (about 9 in. long and 1¼ in. thick), and mortar. In between the construction of this bath and to-day comes the whole History of England.

PARTIAL FALL OF THE CANTERBURY NEW SEWAGE HOUSE.

AN unfortunate occurrence has happened at the outfall of the Canterbury new drainage works on the Broadoak-road. The men employed in the filtering-houses were about to enter at seven o'clock, a.m., according to the *South-Eastern Gazette*, when they heard a crash inside, and in a moment the greater part of the building fell in. The portions of the structure which fell were the two chief roofs, 120 ft. in length and 19 ft. each wide; one being over the filtering department, and the other over the settling-tanks, which were supported by the centre wall. This wall gave way, and with it of course the roofs came down. The cause of the unfortunate occurrence, which has entirely put a stop to the workings, is due, says our authority, to the building having been badly constructed; the walls much too thin, and the general construction of them, as well as of the whole building, bad. The sewage, always passing alongside the 9 in. walls, has had the effect, or rather the acid from it, of eating away the lime, and leaving nothing but the sand, and the immense length of the walls, 160 ft., could not stand long under such circumstances. The building was erected by the contractors of the drainage works, under the supervision of the engineer. The city surveyor (Mr. Hall) had some knowledge of the insecurity of the structure, but not the remotest idea of any such mishap as has taken place, nor had the men regularly employed at the works reported to him anything to lead him to suppose such a thing was likely to occur yet. The parts remaining are the walls inclosing, and the roofs over, the stowage department, and the first tank. The estimated amount of damage is between 600*l*. and 700*l*. Mr. Hall has made arrangements for running the sewage into a ditch until he receives instructions as to the course to be pursued, and he was to present a report upon the subject at a special meeting of the local board.

HALIFAX INFIRMARY.

THE alterations and improvements of this Infirmary are progressing; Mr. J. W. Wilson being the mason, Mr. Plant the joiner, and Mr. Walsh the plumber. The excavation for the new ward has nearly been made. On the principal front improvements are being carried out. The narrow passage running around, and thereby darkening all the basement windows, has been done away with, and a wide slope of grass substituted. The roof of the portico has been releaded and made water-tight, and by lowering the wide footpath leading from the front gates, two additional steps will be added to the broad flight of steps leading to the great doors, and thus more dignity will be given to the Doric front of the building, heightened as it also is by the clearing away of the basement passage. The portion of the New Assembly-rooms taken into the institution, and upon which great alterations have been made, is now nearly ready for use. Out of these rooms a dispensary for out-door patients has been formed. Altogether this part of the establishment, according to our authority the local *Guardian*, will be most complete. The expense incurred upon this part of the extension will exceed 300*l*. When the new ward is built, and the other rooms are converted into wards, the indoor accommodation will be raised from forty-two to seventy beds, and each patient will have a surface of at least 1,500 cubic feet, a great advance upon the present. When completed the total cost of the alterations will exceed 3,000*l*.

SANITARY REPORT, WHITECHAPEL.

MR. JOHN LIDDLE, medical officer of health, in the course of his report for the quarter ending September 28th, says with reference to *underground rooms illegally occupied*:—"The attention of the sanitary officers has, during the last fourteen years, been directed to this matter, and, as is recorded in my quarterly reports, numerous cellars and underground rooms used as dwellings have been discontinued for such use. There is, however, considerable difficulty in dealing with these cases; for it frequently happens that no sooner has one family been compelled to remove, than, in the course of a short time another, or perhaps the same family, again occupies the room. The inspectors, on visiting several new houses which have recently been erected in this district, found that the underground rooms therein were not fit for habitation, yet many of them were occupied by families as sleeping-rooms, contrary to the provisions of the Building Act. It surely would be much better to get enacted a clause, in the proposed new Building Act, to prohibit the letting of any new house, unless all the rooms therein were fit for habitation, than to allow houses to be built with rooms unfit for habitation, and then, when such rooms are found to be occupied, to empower the Local Board to proceed against the persons using them as sleeping apartments."

Mr. Liddle makes some strong remarks on the condition of the *bakehouses* in his district, and adds:—

"From the above return there will scarcely be a difference of opinion regarding the desirability of effecting a sanitary reform in the bakehouses. In those bakehouses which are situated underground,—where there is a want of daylight; where gas is burned to a great extent; where ample provision is not made for carrying off the products of combustion and the heated air which is combined with the sulphurous acid gas given off from the oven fires; and especially where adequate means are not provided for the admission of fresh air,—it may reasonably be expected that men remaining in such places for fourteen hours daily will suffer in their health. In addition to these evils, the men are exposed to the inhalation of the fine particles of flour, which act as a mechanical irritant to the lungs. We need not therefore be surprised to find that consumption is a common complaint among the journeymen bakers. Nearly all the men whom I saw at work were pale and unhealthy-looking. On entering the bakehouses, I found in one or two instances such a difficulty of breathing that I could not remain in them longer than a few minutes; and I learned that, whenever a window was opened to let in light and air, the men, who are generally in a state of perspiration, cannot bear the cold draught which then poured in upon them; and they find it more comfortable to work in a heated and ill-ventilated place than to expose themselves to the painful effects of draughts of cold air."

THE RESTORATION OF SALISBURY CATHEDRAL.

THIS restoration is progressing. During the past year the painting of the choir roof has been restored by Messrs. Clayton & Bell. These paintings, specimens of thirteenth-century work, were covered, like much of the rest of the cathedral, by colour wash, which could not be removed without the destruction of the paintings, which, however, were plainly discernible beneath it. Drawings were made, and the paintings have been reproduced. The design of the roof is said to be foreign. In the centre is a large figure of our Lord within the vesica piscis. He is surrounded by the four Evangelists and twelve Apostles. East of this figure, towards the altar, are designs of the twelve months of the year painted in medallions, six on either side. West of the centre figure are twenty-four figures in medallions, in four rows,—six in a row,—of prophets, each bearing a scroll with a Messianic prophecy thereon. Besides the four greater and twelve minor prophets are Job, Abraham, Isaac, Jacob, Moses, David, Zacharias, and John the Baptist. One bay of the choir wall on the south side, and the east wall, have been painted as a specimen of what existed beneath the wash, and as an inducement to complete this part of the work. The old thirteenth-century stalls, the only fittings of the choir which could be kept, have been cleansed from their paint, and wait for proper canopies to be placed above them. The pavement of the choir, which is to be a mixture of encaustic tiles of the old patterns, and of black and white marble lately in the choir, has been ordered by the committee. This will leave very little in the treasurer's hands, whilst the committee have still to provide all the fittings for the choir. These have been estimated at 8,000*l*., and do not include the reredos and choir screen, which are promised. A lady of the diocese has promised 1,500*l*. towards the canopies of the stalls, estimated at 3,000*l*., on condition that another 1,500*l*. can be raised for the same purpose by Christmas, 1873.

PROPOSED CONVERSION OF PECKHAM RYE INTO A PUBLIC PARK.

THE Camberwell Vestry contemplate forming Peckham Rye into a public park, adding to it a quantity of land at One Tree Hill, Nunhead, which it is proposed to purchase. The proposal has arisen out of the scheme of the Commons Preservation Society requesting the Governors of Dulwich College to dedicate to the public 150 acres of the college estates for the construction of a park in South London. The subject was discussed at the meeting of the Camberwell Vestry last week, when the proposal of the Commons Preservation Society as regards the appropriation of the Dulwich College estates was unfavourably received. It was objected that 150 acres in one piece could not be found on the estate, and that there was a doubt as to the power of the Governors of the College to sell the land for such a purpose, and that, even admitting that they had the power, the cost would be so enormous as to prevent the proposal of the Commons Preservation Society from being carried out. It was urged that according to the present value of land in the neighbourhood of Dulwich the purchase of 150 acres belonging to the college estates would involve an outlay of

150,000*l.*, and it was further pointed out as an objection to the purchase so far as the parish of Camberwell is concerned, that the College estate will in all probability in a short time be occupied with valuable houses, from which a large revenue will be drawn by the parish.

The desirability of a public park in the district was warmly supported by the Vestry, who appear to be unanimously of opinion that Peckham Rye should at once be converted into a park, together with a quantity of land adjoining, up to One Tree Hill, at Nunhead, which should be purchased for the purpose.

Mr. Shields proposed a resolution to this effect, in the course of which he stated that from his own knowledge this land could be purchased at a fair valuation.

The matter was ultimately referred to the favourable considerable of the finance committee, with instructions to report as to the best means of carrying out the object.

ACCIDENTS.

Fall of a Saw-mill.—Extensive stone saw-mills, just constructed by the Portland Stone Company, at Portland, have fallen, injuring several workmen. Some supports gave way whilst a heavy block was being raised.

Fatal Scaffold Accident.—In Tralee, a scaffold erected on the roof of O'Sullivan's Hotel, has given way, and the contractor, Mr. Driscol, and a man named Cusack were killed on the spot. Another had his skull fractured; and a boy had his wrist broken. One man escaped by putting the claw of the hammer he was using into a hole in the slating, and holding on by it.

Fatal Accident in Newcastle.—A fatal accident has occurred to a master builder, named Barron Robson, at the Ouseburn, Newcastle. He was standing on a ladder, repairing the roof of a house at Millar's Hill, when he overbalanced himself, and fell to the ground, a distance of about 18 ft. He sustained serious injuries to his head and hip. The unfortunate man died in the infirmary. Deceased was sixty years of age, and had resided at Ouseburn.

CHARTER-HOUSE SCHOOLS.

The 12th of December is known by Carthusians as Founder's Day, and gives special appropriateness to the illustrations in our present issue. On that date, in the year 1611, died Thomas Sutton, a wealthy citizen, who established what Bacon calls a "triple good,"—a hospital, chapel, and school-house,—on the site of a monastery of the Carthusian order (*Chartreuse*) next Aldersgate-street, completed in 1370. After the Reformation the site of the Charter-house was granted by Henry VIII. to John Brydges, yeoman, and Thomas Hale, groom of the King's tents, as a reward for the safe-keeping of his royal pavilions which were deposited there, as "convenient" to Smithfield. On their surrendering this grant, the king presented the place to Sir Thomas Audley, Speaker of the House of Commons, from whom it passed to Sir Edward North, serjeant-at-law, afterwards Lord North, who was remarkable for keeping on good terms with the winning side all through the political and religious changes of the Tudor era. After some other changes, it came into the hands of the second son of Thomas Howard, Duke of Norfolk, who afterwards sold it to Sutton for 13,000*l.* Sutton died soon after he had commenced his work and obtained a charter from King James, and some of his relatives sought to set aside the will by which he endowed the establishment, but were defeated.

The hospital was to consist of two parts—the one being eighty "poor brethren," and the other being the forty "scholars," "collegers," or "gown boys," as they were formerly called, who from that day to this have formed the nucleus of the Charter-house School. The former were to have rooms rent free, with certain allowances, and a small pension, and also dinner daily in the Great Hall. They were to be, according to the statutes made by the governors, "gentlemen by descent and in poverty; soldiers that have borne arms by sea or by land; merchants decayed by piracy or shipwreck; or servants in the household of the king's or queen's majesty, and not under fifty years of age, unless they had been wounded in the king's service," when they were eligible at forty. The scholars were also to be "poor scholars," in the sense of boys whose parents needed help towards their education. These were to be chosen between the ages of ten and fourteen, and educated, fed, and clothed at the expense of the founder. On leaving school they were to be provided with bourses or exhibitions of 16*l.* a year, in order to help them to meet their expenses at Oxford or Cambridge; or, if they declined to go to the University, they were entitled to a grant of money towards their apprenticeship in other walks of life.

According to a recent account in the *Times*, the number of "poor brethren" or "pensioners" has never been increased from its original number (though their stipends have been raised), and the "poor scholars" remained at forty until some fifty or sixty years ago, when as the nominations to the College had come to be matters of favour and interest, it was resolved by the Governors, at the instance of Lord Grenville, we believe, to add four more, in whose case the election should be made by competition. To show how carelessly such matters were handled by a corporate body in the days of "the Georges," we may mention here that the resolution in favour of the addition of four more boys was carried, but that the condition was accidentally postponed to a second meeting, when it was—perhaps conveniently—forgotten, and the result of Lord Grenville's admirable and foresighted resolution was to increase by four the nominations, and, therefore, also the patronage of the governing body.

About thirty years ago, however, the step then taken was carried out, in spirit, at least; for the Governors resolved to add every year to the College or foundation two boys, chosen by competition, under the age of fifteen years. The competition, however, is limited, for a boy must have been in the school for a year at least, either as a boarder or a day-boy, before he can be admitted to compete.

A few years ago removal was determined on: about seventy acres of an estate near Godalming, formerly belonging to the Deanery of Salisbury, were purchased, and the old site was sold to the Merchant Taylors' Company, the amount received sufficing, we believe, to pay the greater part of the cost of the new buildings, as well as for the land.

The site obtained for the Governors by their architect, Mr. P. C. Hardwick, has special advantages which could scarcely be found elsewhere. It is high and commanding, and yet it has a large level area, and, what is of equal advantage in a sanitary point of view, it has a satisfactory subsoil; thus the ventilation and drainage may be made as good as the most scrupulous can desire.

A cricket-ground several acres in extent overlooks the valley of Godalming, and on its northern boundary is a slightly-raised terrace which extends the whole length of the buildings now erected, and what are proposed hereafter.

The present buildings comprise three houses for masters, with accommodation for 160 boarders, and a central building, which is the general school-room, with six class-rooms attached to it. This has been in use for some months.

The houses are similar in general arrangement; and in addition to the several rooms in a gentleman's house, have a series of rooms set apart for the boys, and those more immediately connected with them. The boys have two rooms on the ground-floor: one for seniors and the other for juniors; and on the upper floor they have large dormitories, each boy having his own "cubicle," all having communication with the external air by means of a wood casement. The senior boys have in addition a separate study.

Closely connected with the above are rooms and a study for an assistant master, and rooms for a matron.

Each house is well furnished with bath-rooms and other accessories.

The chapel is now fast approaching completion, and in no part will the careful painstaking of the head-master be more conspicuous than here. Stained glass, by Messrs. Clayton & Bell, will fill the windows from various donors, commencing with her most gracious Majesty.

The infirmary, or sanatarium, is already commenced, and there is but little doubt that no long time will elapse before two other houses, the sites of which form part of the general scheme, will also be commenced, which will give accommodation for 100 additional boys. Another house could be built on the north side of the cloister court, but this site will possibly be appropriated as a common hall; ample room can be found on the estate for any number of school-houses that the most prosperous establishment may require.

The floors of all the buildings are formed with iron joists and concrete, so as to lessen the danger of fire.

The face-work generally is of local Bargate stone, quarried on the estate, with Bath stone dressings.

We may add to the early part of our notice that the draught of a new scheme proposed for "the Regulation and Government of the Charity called Sutton's Hospital, in Charterhouse, in the county of Middlesex," has just been printed and circulated among the officers of the establishment and the eighty "poor brethren," who still remain, for the present, at least, in their old quarters, in spite of the removal of the school. According to this scheme, the charity and its endowments are to be administered henceforth by the newly-appointed Board of Governors, who are to take measures, under the sanction of the Charity Commissioners, to sell the outlying estates belonging to the Charterhouse, and to invest the sum so realised as part of the principal endowments of the Charity. They are then to divide the clear income annually into two equal parts, the one to be applied to the purposes of the school (including the defrayal of such part of the purchase-money of the new site at Godalming as may not be met by the sale of the playground, &c., in London, to the Merchant Taylors' Company), and the other to the purposes of the "Hospital." The "poor brethren" are to be, as heretofore, "deserving men of good character, widowers or unmarried, in decayed circumstances, being or having been officers in the army or navy, clergymen, merchants, or persons engaged in trading, professional, agricultural, or other similar occupations, who have become reduced by misfortune or accident without their own wilful default, and who shall not be less than sixty years of age at the time of appointment, unless the Governors shall see fit in any special case to relax the restriction as to age in favour of a candidate otherwise duly qualified." Each of these brethren is to have a room or set of rooms in the hospital, with an annual stipend of 36*l.*, and a daily allowance of bread and butter (which the Governors, if they see fit, can commute for an additional payment of 6*l.*), as also a gown or cloak, a "reasonable supply of household linen, fuel, and candles," and a dinner in the Common Hall. These advantages, however, in the lump, the Governors may commute for one fixed annual payment of 80*l.* in any particular case; and if the funds of the charity shall permit, they may bestow annual pensions of 40*l.* or 50*l.* a year upon certain other deserving persons as out-pensioners.

The old building is disappearing. Within the last week the part known as "Gown-Boys," because it was devoted to the residence of the boys upon the College foundation, these boys having hitherto borne that name, has been removed. The building had but few pretensions to architectural beauty, but it was interesting as having been the early home of many persons who afterwards rose to high distinction in Church and State. Together with the "Gown Boys' Hall" has disappeared also the adjoining apartment, which formerly served as the chief school-room, but which bore tokens of having originally formed part of the town mansion of the Howards. We may add that certain arches, with names of the "boys" deeply cut, have been carefully taken down, and will be refixed in some conspicuous portion of the new building, so that the names of the old boys may not be forgotten in the new home.

REFERENCE TO PLAN.

1. Tower.
2. Staircase.
3. Corridor.
4. Cloister.
5. Library.
6. Master's common room.
7. Boys' room.
8. Area.
9. Boys.
10. Lavatory.
11. Boys' w.c.
12. Kitchen.
13. Scullery.
14. Manciple.
15. Bath-room.
16. Servants' hall.
17. Stationery.
18. Pantry.
19. Parlour.
20. Buttery.
21. Passage.
22. Governors' room.
23. Sitting-room.
24. Waiting-room.
25. Press-room.
26. Boots.
27. Boys' entrance.
28. Boys' stairs.
29. Master's-room.
30. Drawing-room.
31. Housekeeper.
32. Store.
33. Butler.
34. Bed.
35. Plate.
36. Dining-room.
37. Hall.
38. Morning-room.
39. Buttery.
40. Servants' entrance.
41. Master's dining-room.
42. School.
43. Proposed extension of school.
44. Additional master's house.
45. Site for additional master's house, or common hall.

Earth closets.

GRATES AND STOVES.*

As regards grates, the varieties of which are endless, I can only deal with some of the more prominent points of those at present before the public, and note the principles which are or should be observed in them.

The more that fire-brick or fire-clay enters into the composition of the part which encloses the fire the better. It absorbs heat which would otherwise escape, and can communicate it to air passing through spaces in contact with it, without the unpleasant, and doubtless unwholesome, sensation caused by air which is overheated by contact with iron.

The depth from front to back should be small, sufficient that the body of fuel be not too soon exhausted, but no more, or much of the heat generated within the mass of fuel, being prevented from radiating, will be lost.

The form of the back, by what is called the Milner plan, described in a letter to the *Standard* by Mr. W. H. Wheeler, C.E., being in shape like the angular part of the letter K, projecting inwards, about 1 ft. above the grate-bottom, and then returning back, is good, as the angle catches the flame and reflects it into the room, and the smoke curling round the projection comes in contact with the red-hot fire-clay, and thereby is partially consumed. The bottom of the grate by this plan is raised not more than 4 in. above the hearth, and is of solid fire-bricks or a fire-clay slab; the fire made on which gives greater heat and consumes less coal than in ordinary grates.

The slow-combustion grate, advertised by Clark & Hunt, has the fire so placed on a low slab, and inclosed by fire-brick, but would be improved by adding the Milner back. Existing grates may be brought partly under the same conditions by fitting plates of sheet-iron over their gratings at the bottom, to prevent air entering from below. The grate should be half filled with nuts of coal, and the fire made upon this stratum of fuel and allowed gradually to burn down to it. Dr. Arnott's grate is upon this principle, having a box with supply of coal beneath, which is lifted as required upwards to the fire above. The principle would be still further carried out by having the flue beneath, instead of above the grate, if proper draught could be insured; but systems of descending flues are seldom to be depended upon.

There is, without doubt, economy in the plan of thus burning coal downwards; but it demands patience as well as care, for it takes a long time for the fire to become a good one, and it is apt to become dull, so that when really cold a poker frequently disturbs its stratification. Then, though some description of coal can so be wholly consumed, other ashes of other qualities cannot, and thus the fire becomes choked.

To inclose the space underneath the bottom formed by an iron grating would answer the same purpose of preventing air feeding the fire from below, and yet allow ashes to fall through, and these could be removed daily by the servant, by means of a removable door.

The late Mr. Pierce's (now Penfold's) fire-lump grates, and those of Mr. Edwards and others, are good in having the fire surrounded by fire-clay, and the backs grooved behind for the passage of air to be warmed and conveyed where desired. They would be improved by one or other treatment of bottom suggested, and by the Milner form of the back, as also by the provision of a larger space for warming air behind. The invention by Messrs. Young, of Queen-street, Cheapside, recently described in a letter to the *Times*, for introducing fresh supplies of coal when needed into ordinary grates and ranges, into the bottom instead of on to the top of the fire, has the same desired end of making the smoke pass through an already heated mass of fuel, and so becoming consumed, and loss of heating power prevented. Mr. John Taylor, of Whitehall, has an extremely ingenious patented arrangement by which the smoke, after it has risen from the fire, is diverted by a damper, and made to pass round and re-enter the grate at the lower part of one side, and pass through deep bars, of which the bottom is composed, so that the smoke is consumed, and only gaseous products of combustion escape through the other side to the flue proper. Thus the fire is intensified and made brilliant, creation of soot in the flue to a great degree prevented, and fresh air is admitted from the front of the grate through chambers in the substance of the fire-brick sides, which have had the heat passing entirely round them. Mr. Taylor has recently at my request simplified its details, so that it should be as self-acting as possible, which I consider essential.

Captain Galton's stove has excellent merits in a roomy accessible heating chamber behind; in the proper connexion of the flue from the grate with the brickwork flue above, so that smoke cannot leak into the hot-air chamber; in the facility of introducing the warmed air through any part of the chimney-breast, or to other rooms; and in the shape of the back being concave, so as to have the same effect as the Milner back; but it would, in my opinion, make this grate more economical to shut off the air from the bottom, and feed it only from the front and top.

Mr. Boyd admits warmed fresh air copiously by an ornamental panel above the fireplace opening, whence it rises into the room. This, or the sides of the chimney-breast, are as good positions for inlets as can be chosen; but, if the air enter by the hearth or sides of grates, it will be drawn at once by the fire, and defeat the purpose of ventilating the apartment.

Such grates and arrangements, however, seldom find their way into the bulk of the houses of the middle class; it may be well, therefore, to state that, of ordinary ironmongers' goods, those which have regulating louvres or small doors to the flues at back are economical of heat, minimising the portion that escapes to the flue. Provision of air, however, must in some shape be secured, unless health is to be sacrificed.

Greater economy and more heat will be obtained by those who confine their metal-work to the front bars, and simply construct the rest with fire-bricks or fire-clay slabs.

Even ordinary grates may be improved by getting common pipeclay and modelling it to the shape suggested, covering bottom, sides, and back, and lighting a fire of sticks within to dry it. This will last from two to three years with care, and is not costly to replace.

It is possible, however, while saving at the spigot to lose at the bunghole; or, while careful about the parlour fire, to draw unduly at the coal-cellar for the kitchen range. The ordinary close range, though one of the best inventions of the age, is usually greedy of fuel. If it have, as it may, to aid in warming the house, and ventilate by extraction of foul air, and to heat water for baths, as well as to cook, it will need to be correspondingly fed. The Cromer range has been arranged specially, at my suggestion, to meet the varied demands of cottage and mansion with the smallest expenditure of coal, by Mr. John Barber, engineer, of Leeds, to whom I am in the habit of sending all problems of this kind which arise in my practice to be worked out.

* * * * *

Gas, at present, with the appliances in use, does not contrast favourably with coal in point of economy as a means of warming houses where the work is continuous, but may yet be made very serviceable, and even economically so upon occasion. It can be turned on at a moment's notice, and its full effect attained speedily; it demands little attention and causes no work, and is extinguished as suddenly as it was kindled. These qualities commend it for studies, bed and dressing rooms, and wherever heat may be needed quickly and for a short time only. It can be made cheerful in appearance, making lumps of asbestos, &c., glow with heat as red-hot coals.

Mr. Hammond, gas engineer, of Chandos-street, informs me that, according to experiments he has made, a coal-fire maintained by 20 lb. of coal at a cost of 3½d., when the price is 30s. per ton, will produce as good a result as the combustion of 200 ft. of gas, which costs 9d., at 3s. 9d. per 1,000, both fires being ten hours in action. But he states that when the work is occasional, intermittent, or for short periods, and the waste in lighting up taken into account, gas is not only more cleanly and convenient, but far cheaper than coal, and when coal-fires necessitate extra cost for attendance, this will frequently make gas the cheaper heating agent. Mr. James Thompson found, by an average of thirty-six experiments, that he had to consume 4½ lb. of coals—value, with lighting-wood at present prices, nine-tenths of a penny,—to raise one gallon of water to boiling-point; 4 cubic feet of gas, costing two-tenths of a penny, doing the same work at less than one-fourth of the cost.

There is a grate of French invention in which a ring of gas, burning out of sight above the opening, throws a brilliant glare upon a polished reflecting metal bottom and back, which radiate heat well, and have a pleasing effect. The cleanliness and beauty of this would make it very applicable to secondary fireplaces in a suite of saloons.

George's Gas Calorigen cleverly disposes of the products of combustion by the same pipe which admits the air supply for the purpose, and provides the apartment with fresh air warmed in passage through another pipe heated by a ring of gas-jets.

All these gas-stoves, as indeed gas-illuminating burners, should, if to be tolerated, have flues to conduct out of the house the products of combustion; but Dr. Taylor claims to have invented a "self-purifying gas stove," with a chemical substance by which the noxious products passing are decomposed. For these, Messrs. Hodge, of 100, Hatton-garden, are agents, and if their promises be realised, they solve a difficult problem, and may tend to the wider introduction of gas as a heating medium for houses.

Gas-stoves constructed with rapid circulation like Gill stoves, disposing satisfactorily of the products of combustion, and warming the air by the inlets to be provided for general ventilation, would, I believe, warm houses cheaper than coal fires at the present price of gas, when account has been taken of the saving in cost of building, furnishing, and maintaining in order, all the provisions and appliances necessary for ordinary grates and stoves.

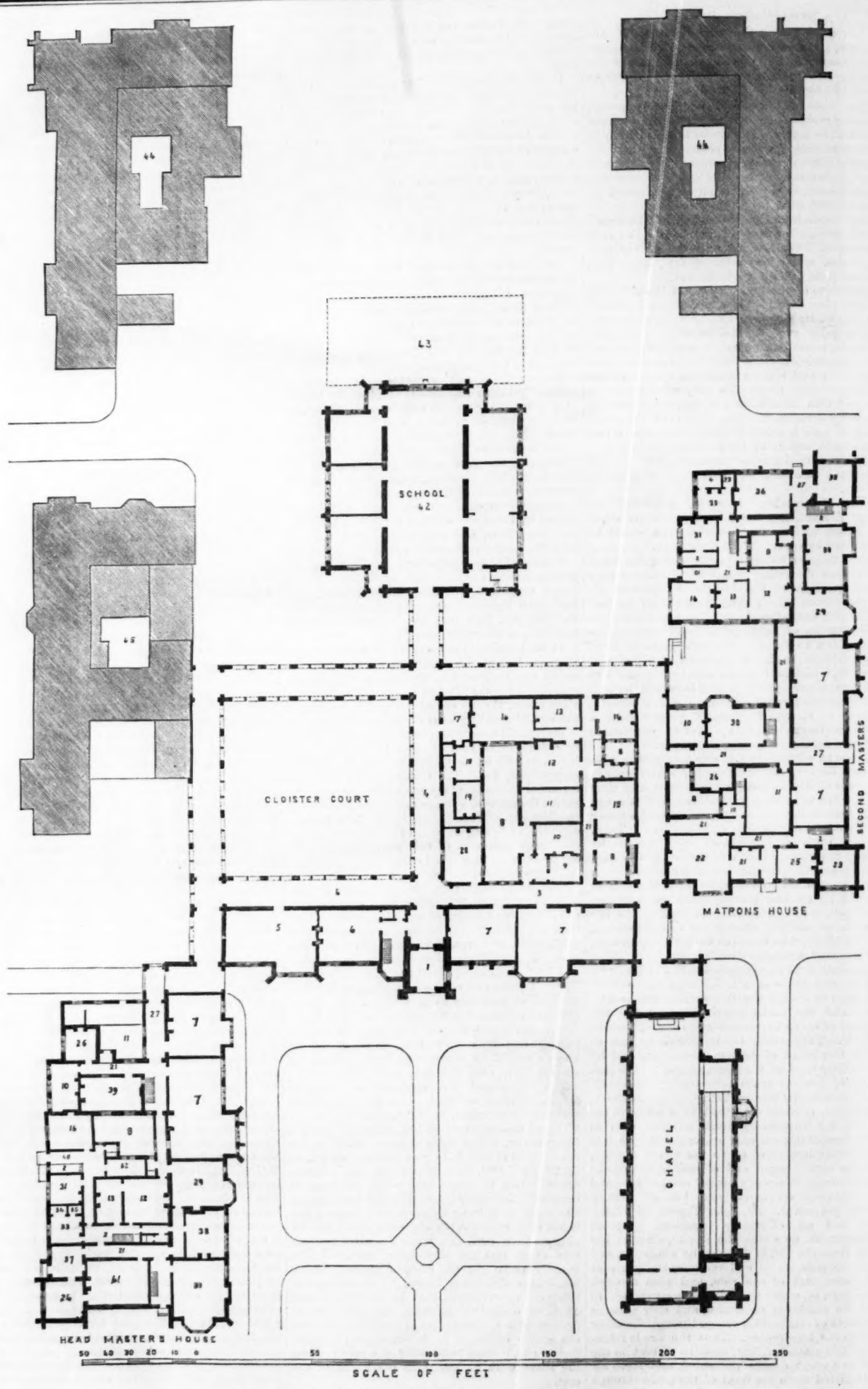
* By Mr. J. P. Seddon. See p. 969, *ante*.

THE ANCIENT ACCOUNT OF THE DELUGE.

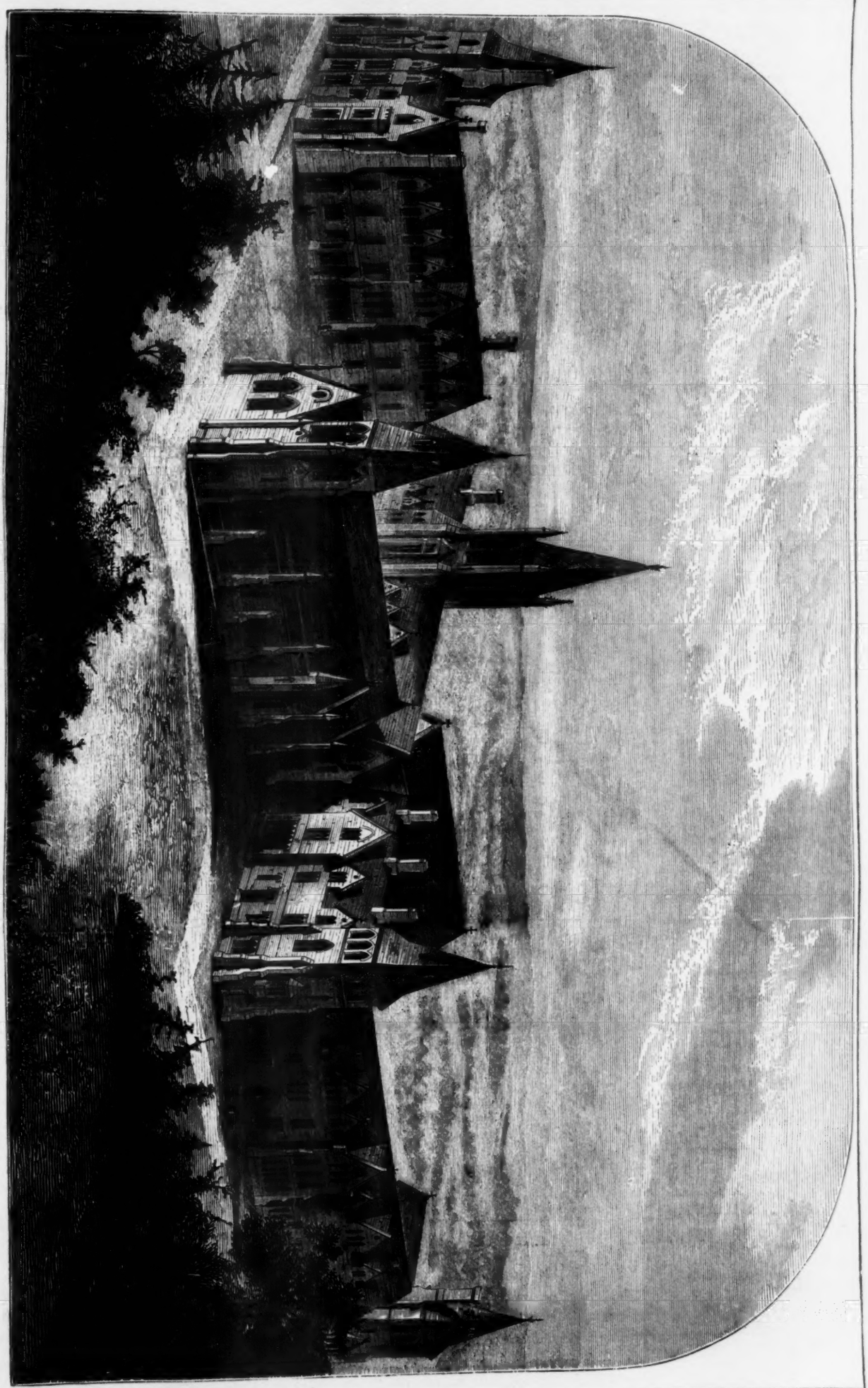
IN the paper read at the Society of Biblical Archæology, Mr. Smith commenced by describing the discovery of the tablets containing the text of the Deluge, which date from the reign of Assurbanipal, king of Assyria, B.C. 668. These tablets were copies from more ancient tablets, which Mr. Smith placed 1600 B.C. The Deluge text forms part of a series of legends belonging to the reign of a king named Izdubar. Mr. Smith describes how Izdubar, falling ill, went to seek Sisit, the Xisuthrus of the Greeks, who was supposed to have been translated. The legend describes Izdubar as seeing Sisit, who, in answer to a question from Izdubar, relates the story of the Flood. Sisit states that the gods revealed to himself the coming deluge, and commanded him to build a ship and put his family and all the seed of life into it; the ship was then to be launched into the sea. Sisit relates how he finished the ark, coated it with bitumen, and placed his treasures and family, his servants, and the beasts of the field in it; he then gives the command of Shamas to him to enter the ark and shut the door, followed by his obeying the command and the commencement of the Flood.

After the description of the Flood, the story described the stranding of the ship on a mountain in Nizir, east of Assyria, and the sending out from it by Sisit first of a dove, next a swallow, and last of a raven. The animals were afterwards sent out of the ship, and Sisit built an altar and offered sacrifices.

At the conclusion of the reading of Mr. G. Smith's paper, the chairman, Sir H. Rawlinson, offered some remarks on the probable age of the Babylonian legend of the Deluge. He showed grounds for believing that the historical chronology of Babylon ascended to a period at least 5,000 years before the Christian era. There was a recorded date in the inscriptions of B.C. 2280 for the conquest of Babylon by the Medes, and the number of kings assigned by Berosus to the dynasty which preceded that event would place the commencement of the historical era in about B.C. 5150. The deified Sage to whom Mr. Smith had given the provisional name of *Izdubar*, and who in his search for immortality had learnt the legend of the Deluge from *Sisit*, must be placed beyond the historical limit, but how much beyond it was of course impossible to say. The Greeks, who had picked up the early traditions of Babylon, appeared, however, to indicate a date by placing the Proto-Patriarch, from whom the Babylonians had acquired the knowledge of astronomy, astrology, magic, and genethliology, 6,000 years before Plato, or 5,000 years before the Trojan war, that is, above 1,000 years before the commencement of the historical period. If *Izdubar*, the first civiliser of the Babylonians, lived about B.C. 6400, they would still have to ascend to a much earlier period for the age of *Sisit*, who was the hero of the Flood, and from whom the legend professed to come.



THE NEW SCHOOLS FOR CHARTERHOUSE, GODALMING.—*Plan.*



CHARTERHOUSE SCHOOLS, GODALMING, SURREY.—MR. P. C. HARDWICK, ARCHITECT.

SCHOOL BOARDS.

Ipswich.—The chairman said he had had under consideration the rules issued by the Royal Institute of British Architects, which had been sent by Mr. Eyton, architect for Argyll-street School, in support of an application by him for payment to him of 5 per cent. upon the instalments paid to the builders, or half the commission on signing the contract and the remainder on the completion of the work, and it seemed that those rules supported the claim. The rules, however, were not in any way binding on the Board. It was agreed that 25*l.*, 5 per cent. on the instalment paid to the builder, be paid to Mr. Eyton.

Carlisle.—The clerk reported that there had been a meeting of the Sites Committee, at which they examined six sets of plans sent in for the new schools proposed to be built. These were from Mr. D. Birkett, Carlisle; Mr. Crosby Hetherington, Carlisle; Messrs. Schools & Cory, London; Messrs. Brabe & Smales, Kendal; "Spes," and "Knowledge is Power," whose letters containing names and addresses are not yet opened. As there were only six sets the committee had left the decision to the Board. After a brief conversation it was decided to exhibit the whole of the plans to the public before any decision were come to. The plans were to be hung in the School of Art, Fisher-street, for public inspection.

Liverpool.—Mr. Whitty moved a recommendation of the Sites and Building Committee, that the Board adopt the plans of Messrs. Reade & Goodison, for the proposed temporary schools. He explained that other plans were brought in competition with these, but the cost would be 100*l.* more. The school might be moved anywhere. In the event of a site not being obtained the plan would not be proceeded with. The cost was estimated at 1,150*l.* The recommendation was agreed to.

We have engraved views and plans of a number of the schools which are about to be erected for the London School Board, and shall take early opportunities to publish them.

NEW DWELLINGS FOR THE POOR AT THE HOLBORN VIADUCT.

THE Holborn Board of Works are taking steps to compel the City Corporation to erect dwellings for the poor near the Holborn Viaduct. The clerk to the Board last week wrote a letter to the Corporation, to the effect that the City municipal body have failed to comply with the Holborn Improvement Act, by which it is provided that they are to build dwelling-houses for the working classes, in room of those taken down to complete the Holborn Viaduct works. It appears from the reply which has been received to this communication from the Corporation, that the subject is now under the consideration of the Improvement Committee, with the view of the buildings in question being proceeded with.

PAYMENT OF ARCHITECTS.

WITH reference to recent observations on this subject, it is, I think, a moot point whether 5 per cent. is a proper and sufficient remuneration for the ordinary professional man. It used to be considered so, and is still, by a large section of the building public, if one may judge by the magnificent offers one sees now and then in your advertising columns. Still, the advance would not lack a precedent. Another *professional man* has just succeeded in getting an advance of 5 per cent.,—I mean our respected relative, the "pawnbroker." Whether architects and engineers would like to be associated in the same category I cannot say; but I must confess, I never could, in his case, see why his gains should be increased from 20 to 25 per cent. per annum, at the expense of perhaps the most unfortunate section of our community. Whether there is sufficient cohesion in the architectural profession to compel a general advance, is also, I think, a very doubtful question. I know there are architects who now never get 5 per cent., except on occasional small jobs; and I could name one who commands the work of one of our town corporations in the North, who, some months ago, offered to design and superintend the erection of a large building for a company, and pay the wages of a clerk of works, out of 1½ per cent. on the outlay.

I am very glad indeed to hear from so good an authority that, "not only the cost of living, but the very salaries of clerks and assistants, are so materially increased." As I belong to that class, and have heard many inquiries on that point, I may say, that in my case, and as far as I can ascertain generally, salaries to clerks and assistants have not increased in nearly the same ratio as the cost of living. I wish they had. That is about the last thing architects think of doing, with rare exceptions. I know that, unless an advance is made on the present remuneration of my class, one, at least, will "do his endeavour" to emancipate himself from that position. There are great numbers too many of us.

E. G.

YOUR correspondent, "Stentor," has already been answered. He is surely not likely to assert that the price of building has not increased at so high a rate as has the price of provisions, clothing, and the like? In Mr. Brassey's "Work and Wages," however, there is given a statement on this point (p. 197), furnished by Messrs. Lucas, which, if correct, places this view out of the question. I append it:—

"We find," they write, "for some years previous to September, 1853, that the rate of wages was as follows:—

	For Mechanics, Masons, Bricklayers, Carpenters, and Plasterers.	Labourers.
Previous to 1853	5s. per day of ten hours	3s. per day of ten hours.
From Sept., 1853, to March, 1861	5s. 6d. per day of ten hours	3s. 4d. per day of ten hours.
From March, 1861, to Sept., 1865	7d. per hour or 5s. 10d. per day	4½d. per hour, or 3s. 6½d. per day.
From Sept. 1865, to May, 1866	7½d. per hour, or 6s. 3d. per day	4½d. per hour, or 3s. 9d. per day.
From May, 1866, to present time	8d. per hour, or 6s. 8d. per day	4¾d. per hour, or 3s. 11½d. per day.

And we consider that the price of building is *twenty-five to thirty per cent.* more now than it was in 1853."

This calculation was made, of course, before the advance in wages of this year, which would make this per-centage higher still—say, roughly, forty.

F. H. A. H.

NEW LUNATIC ASYLUM FOR MIDDLESEX.

AT the last general meeting of the Middlesex magistrates, a report was received from a committee appointed on the 30th of November, 1871, to procure plans and estimates of cost for the erection of an asylum for the reception of chronic patients to the number of 1,700. The committee recommended that the block system in use at Leavesden should be adopted, and that plans should be prepared, and the committee instructed Mr. F. H. Pownall to prepare plans and estimates for the erection of an asylum on the block system, to contain about 1,600 patients, but capable of enlargement so as to receive 2,000. Mr. Pownall had submitted plans and estimates for the reception of 1,700 patients, and recommended that they should be carried into effect at an estimated cost of 140,000*l.*, including commission.

The plans and estimates submitted were approved by the court, subject to the consent of the Secretary of State. The committee were authorised to take the necessary steps to carry the plans into effect, and to enter into contracts for the erection of the asylum. The committee were also authorised to accept a tender from Messrs. Eastons & Anderson for sinking a well and providing a pump on the site, at a cost not exceeding 3,560*l.*

WORKMEN'S SOCIETIES.

AT a recent public meeting of the Birkenhead branch of the Amalgamated Society of Carpenters and Joiners, the sum of 100*l.*, accident benefit of the society, was presented to George Latham, one of their members, who has been disabled by disease from following his employment. The presentation was made by Mr. J. Todd, the secretary of the local branch, who enumerated the benefits to be gained by workmen becoming members. Since its establishment in 1860, the society had paid away not less than 95,000*l.* in benefit donations, of which 39,000*l.* were for men out of work, 30,000*l.* for sick members, 3,000*l.* for loss of tools, 5,000*l.* for funerals, &c. The local branch had been formed in 1863, with eleven members, and it now had 150, with a balance in the bank of upwards of 200*l.*; the general society had over 10,000 members, and funds in hand of nearly 17,000*l.*

At a similar meeting of the Bradford Operative Stone-masons' Society, a gratuity of 50*l.* was presented to Nathaniel Watts, a disabled member of the society. The Mayor (Mr. Thompson) presided. The Mayor addressed the meeting. He expressed his entire sympathy with the benevolent objects of the Operative Masons' Society, and also expressed his approval of every legal effort made on the part of trade-unions to obtain a reasonable advance of the wages, but strongly condemned the strikes of the London gasworkers and that of the London police as being perfectly unjustifiable, as well as all unfair and violent attempts to prevent non-unionists from following any occupation they thought proper.

"ARCHITECTS" IN ANCIENT TIMES.

SIR,—I was glad to see that your correspondent "Alpha" had called attention to the unsoundness of view and false deductions of the writer in the *Quarterly*, founded chiefly upon imperfect quotations from Greek literature, as to the absence of anything like an architectural profession in ancient times. The quotation from Plato is so peculiarly direct that in *his* time, at all events, there *was* such a distinction of the "architect" as is known to *our* time, that, as the writer of the articles referred to by your correspondent, it may be interesting for me to say that the quotation as used by me is from the late Lord Aberdeen's work on "The Principles of Beauty in Greek Architecture," published at one time with Stuart & Revett's "Athens," but since as a separate publication (Weale).

J. H. B.

OLD LONDON.

A CORRESPONDENT writes,—In getting out the ground for Messrs. Hilditch's new silk warehouse, at the corner of Cheapside and Old Change, the workmen employed by Messrs. Sharpington & Cole, the contractors, under the direction of Mr. Stephen Rolfe, the general foreman of works, at the depth of 26 ft. below the pavement, dug up a quantity of bones, amongst which was the skull of a wolf; some deers' skulls, with the horns attached, in a perfect state of preservation; several fragments of broken skulls and horns; and what were evidently the fore-arm and some ribs of a human body. In digging for the foundation for the centre column, some fragments of pottery,—ancient water-vessels,—were dug up: on the handle of one was a name,—supposed the maker's,—and on the handle of another, the number "912." In underpinning the party-wall of the adjoining premises, at a considerable depth below the old foundation, some unmistakable evidence of the Great Fire was brought to light,—several pieces of burnt and blackened stone, which at some time had formed part of the mullions and jambs of a large window.

ARCHITECTURAL COMPETITIONS.

SIR,—In reference to Mr. Strong's letter on this matter in your last issue, may I raise a question on the policy and practical results of this course?

Is it not a fact that, as a rule, employers, or would-be employers, resent professional interference and suggestions as to the course that they should pursue as an impertinence? Architects commonly do so with builders and those they employ.

Is it not a fact that the most prominent result of this trade-unionism (for such, in truth, it is) has been to induce committees to append such a note as this to the advertisements they issue in your columns: "The committee to be the judges of the designs"?

Are committees so obtuse that they can see unmoved the torrent of abuse poured out upon them equalled only by the self-glorification of the architects?

Is it not a fact that, owing to the ill-advised action of the Institute in the matter of the drawings for the Houses of Parliament, the Office of Works drew up a "memorandum of the terms of appointment of architects for public buildings," of which clause 17 provides that "no rules of the R.I.B.A. or any other society shall be held binding upon the Commissioners in reference to the works or matters herein referred to"?

Is not the Institute regarded as an Institute of meddlesome people continually interfering with the business of others, and fancying itself slighted by those who decline or resent its advice?

Is it not obvious that we are gradually arraying the public bodies against us? That by trumpeting forth our honesty, integrity, and self-sacrificing qualities, we are suggesting the opposite ideas?

These are signs of the times that it would be well to take to heart; and if, instead of cavilling at the outside world, who need our services, but distrust our capacity, we were to talk a little less, and study a little more, we should leave less room for builders and upholsterers to practise architecture and build, as they do, some of the largest mansions for the "upper ten."

It would be interesting to know how many of the 250 Fellows of the R.I.B.A. write their own specifications, or are capable of doing it. Quantity surveyors and builders will bear me out in this dubious point. These are the men who aspire to be arbiters on all disputed accounts, and to dictate to their brethren and to their employers what they shall do, and what they shall not do. I do not wish to cast any slur upon the "upper ten" of the Institute—their ability and high position are unquestioned, and lesser men feel a pride in being associated with them, and we never hear them cavilling on the question of competitions.

Let us leave trades-unionism to gas-stokers and building operatives, and note its results, but let us have *free trade:* merit needs no recommendation, or to be fenced about by bye-laws. If we must fight for our living, let us fight, and let those who cannot do so stand aside. We shall not always have to fight—some will get to the front. Let us, at all events, cease raving about our ill-treatment, and this unseemly quarrelling with our employers. THOS. CHAS. SORBY.

STREETS IMPROVEMENT.

SIR,—Whatever may eventually be the beauty or otherwise of the new offices now being built for the Provident Institution Savings' Bank, at the north end of St. Martin's-place, Charing-cross, it must strike all who pass that way (I am thankful I seldom have occasion to do so), that it is simply a blocking up of what ought to be a fine opening into St. Martin's-lane, and thus losing an opportunity for starting a wide street from Charing-cross to Oxford-street and Tottenham-court-road, which has so long been wanted, and much talked about.

The new buildings now being erected are certainly set back a few feet (say 7 or 8), from what was formerly the line of old houses; but what is this trifle compared with what ought to be done, viz.—the pulling down and setting back of all the west side of St. Martin's-lane, to form a street as wide as St. Martin's-place? I need not occupy any more space in arguing for so desirable an object, but must express wonder that it has not before been attended to by the proper authorities, whoever they may be.

W. H. E.

ARCHITECTURE AND CONCRETE BUILDING.

IN the report lately given in your journal of the meeting of the Northern Architectural Association, at which the discussion turned upon the uses of concrete in building, it is remarkable that points were raised which have, from time to time, been already ably discussed by various correspondents in your pages. Mr. Olliver, at the meeting referred to, remarked, "that assuming the adaptability and suitability of concrete for building purposes, it would yet remain destitute of æsthetic and architectural character, and that resort must still be had to stucco and painting." Now, this is just the one conclusion which your correspondents have pointed out need *not* be arrived at, but on the contrary, that if the durability of concrete *is* established as free from contraction and expansion, it offers a wide field for the employment of a mode of architectural decoration, already coming more and more into vogue, and which is yet destined, probably, to play a very important part in city or town architecture, with the best and most pleasing results. I refer, as in a former communication, to encaustic tiling, which would be admirably adapted for facing concrete buildings, whether as an internal or external decoration. What is sought at present for architectural effect in relief of parts, special features, and carved surfaces, but which is so ruinously thrown away under the dirt-producing and corroding influences of a city atmosphere, would be more than supplied by the gradation of colour, arrangement of pattern, &c., of which encaustic tile decoration would be susceptible. I am persuaded that one good, thoroughly *artistic* attempt at this would go a long way to initiate a much-desired change in our present overdone styles. The conditions of success, however, would be, first, to have good and simple *proportions* in the *mass* of the building, and in its *subordinate parts*, a sufficient variation of surfaces, *i.e.*, not all one dead level, and then a well-studied and skilful arrangement of colour and pattern in the tiling for the respective parts of the building. All should be of an *architectural* character, and designed and executed specially for the building in hand, and not selected merely from already made patterns, unless these fully answered to that *artistic thought* which we want to bring into all our architecture, and for the lack of which we have so much that has neither vitality nor originality. The beautiful patterns already produced in encaustic tiling for minor purposes show its thorough capability, as also the remarkable skill and success in design and colour which this species of English art has attained to. Its variety and extended use are endless, and need not stop short of all here indicated as a most pleasing and effective exterior decoration, which would have the charm of novelty, variety, light, and cleanliness, in a remarkable degree, and which would set at rest for ever all questions of decay of material, recleaning, or repainting, which at present afflict all city architecture.

NEMO.

GENERAL ASSOCIATION OF MASTER BUILDERS OF LONDON.

THE first general meeting of this Association was held on Tuesday last, at the Westminster Palace Hotel, Mr. Hannen in the chair, and was well and influentially attended. A code of rules, previously prepared by a committee, was adopted, and the following were elected officers and committee:—

President—Mr. B. Hannen (Holland & Hannen).
Vice-Presidents—Mr. C. Lucas (Lucas, Brothers); Mr. G. F. Trollope (George Trollope & Sons).
Treasurer—Mr. G. Dines (Dines & Banderet).
Honorary Secretary—Mr. Stanley G. Bird.
Committee—Messrs. W. Brass, B. Colls (B. Colls & Sons), F. Dove (Dove, Brothers), J. M. Hawkins (Henshaw & Co.), T. R. Hill (Hill & Sons), Horner (Ashby & Horner), C. W. Jackson (Jackson & Shaw), J. M. Macey, Manley (Manley & Rogers), G. Myers (Myers & Son), T. F. Rider (Rider & Son), Robinson (Brown & Robinson), Scrivener (Scrivener & White), J. Sewell (Sewell & Sons), H. G. Smith (G. Smith & Co.), Waller (Waller & Son).

The Association at present consists of 352 members, usually employing about 33,000 men.

HINTS TAKEN.

SOME of my letters to the *Builder* are doing good for the public, viz., public-house traps are being renewed without the conical stand-up hobnails; coal-cellar plates are receiving attention; india-rubber scrapers are now used in the City to clean the pavements; the rotary blast-fan is being adopted in coal-mines; gluey water for watering streets; and many other suggestions of mine that have appeared in the *Builder*. Thanks to Mr. Editor, or my ideas would never have been known.

R. T.

HIGH WAGES AND LOW LIVING *VERSUS* LOW WAGES AND HIGH LIVING.

SIR,—Wandering through a portion of a neighbouring town the other day, where every house in the locality is occupied by members of the working class, I could not help being struck by the appearance of the residences of men earning nearly two pounds a week, and contrasting it unfavourably with the homes of the many underpaid clerks and assistants, professional and otherwise (whose income is about the same as the above), or the homes of the much-pitied agricultural labourer, who earns a half, a third, and in some cases a fourth, of the wages of the skilled labourer.

In the first case, we find neglected rows of tenements, mostly dirty, ill-conditioned, unsavoury, and unsanitary within and without, in keeping with the personal appearance of the women and children. In the second, rows of well-kept dwellings, at a moderate rent, in a "cheap" suburb, neatly furnished, with an appearance of comfort, not forgetting the sometimes objectionable piano, suggestive of evening amusement. The third case offers, except where generous landlords have been content to receive a very small return for a very large outlay, a cottage dwelling, often aptly termed a "hovel," yet so tidy, and so made the most of that the interior at least is generally sweet, clean, and inviting.

Why will the skilled workman, with these examples before him, disgrace himself by living as he does? His answer may be, "We cannot get buildings to live in in which we can take a pride;" to which I reply, "It is not so. 'Bad workmen quarrel with their tools.' It is not speculative building; all alike suffer from that curse. *It is in the method of keeping them in order.*"

It is true the clerks and assistants aforesaid do not pay tribute to the "union," nor are they liable to all the sucking processes of that excellent institution, neither do they go on strike or often get intoxicated, but they are obliged by the position they hold to dress themselves and their families decently, and keep their homes respectably, on 100*l.* a year in most cases. Again, I ask, why cannot the working man do the same? Is it from want of proper education or of that refinement, as necessary to the individual who forms a unit in any civilised society as it is to the character of the work put into his hand? Is it quite impossible for him to rise from his self-degradation, purify his conversation, and improve his mind in these times of "shorter hours" and "higher pay?"

J. J. A.

BUILDERS' RESPONSIBILITIES.

PEARSON V. JOHNSON AND ANOTHER.

IN this case, tried at Manchester before Mr. Justice Mellor and a special jury, the plaintiff was an engine-driver on a travelling crane used by the defendants, a firm of builders in London, and the plaintiff's employers, to raise stones at the building of the new Town-hall in Manchester, for which they were the contractors; and he brought this action for the defendants' alleged negligence in respect of the state and condition of the crane, by reason of which it broke, and he, together with the engine, stone, and whole apparatus, were precipitated to the ground and suffered most serious injuries, by which he is rendered a cripple. The alleged imperfection in the crane lay in the rottenness of the "beam," which the plaintiff and his witnesses said was evidenced by a crack which was noticed in it some time prior to the accident, and was known to several of the plaintiff's fellow-workmen, and also to the managers of the works in Manchester.

At the end of the plaintiff's case the defendants' counsel applied for a nonsuit, on the ground that there was no personal negligence in the defendants themselves, which was necessary to render them liable to their servant in an action for negligence; and that in respect to saddling their employers with liability for negligence, superintendents or managers of works are but fellow-servants with those engaged upon the works themselves, and the masters cannot be made answerable for the results of their negligence to a workman. He cited "Wilson *v.* Merry" (*Law Report* 1, *Scotch Appeals* 327), "Feltham *v.* England" (*Law Report* 2, *Queen's Bench* 33), and other cases.

The judge declined to stop the case, but gave the counsel leave to move upon the point.

The latter then said that the plaintiff's injuries were so serious that he would not seek to alter the view of the facts spoken to as the origin of the accident; but he would call the two managers of the works with a view to showing that their position was in reality only subordinate. This was done, and the jury assessed the damages at 500*l.*, that being the only question left to them.

RESPONSIBILITY OF BUILDING COMMITTEES.

IN the Court of Common Pleas, Dec. 2 (sittings at Nisi Prius, in Middlesex, before Mr. Justice Keating and a special jury), the case of Whillier *v.* Roberts and Others, came on.

The plaintiff in this case was a builder in the City, and he sued the members of the building committee of Christ Church, Lower Clapton, to recover 274*l.* 2*s.*, balance due for the work done in erecting that structure. All the members of the committee suffered judgment by default except Mr. Roberts, who disputed his liability.

The evidence for the plaintiff was that Mr. Roberts had attended two meetings of the committee, and at one of them, held on the 26th of November, 1869, he seconded a resolution that the secretary be directed to communicate with Messrs. Whigginton & Morris that their plan for building the church was accepted, subject to certain terms and alterations. One of the terms was, that the contract should not be for more than 5,500*l.* The contract actually entered into was for 5,565*l.*, and the cost of the building, including extras, was 6,624*l.* 2*s.*, of which all but the balance now claimed had been paid, a large part by members of the committee. It further appeared that Mr. Roberts had early retired from the committee.

Mr. Garth submitted that there was no case for the jury, because Mr. Roberts was no party to the contract for 5,500*l.* More than this amount had been paid.

Mr. Justice Keating said that he would leave the case to the jury, but reserve the question of law for the full Court.

The case for the defendant was that the church was to be paid for by subscriptions, the committee incurring no personal responsibility.

Mr. Justice Keating, in summing up, said that the question was whether the defendant had held himself out, or had authorised other people to hold him out, as liable to pay the sum claimed.

The jury, after an hour, found a verdict for the plaintiff, the defendant being liable in reference only to the original contract and the alterations necessary in it.

Leave was reserved to move to enter a verdict for the defendant, or a nonsuit, or to reduce the amount of the verdict.

FIRE-PROOF FLOORS.

SIR,—In the *Builder* of November 30th, your correspondent "Y.," commenting upon Mr. Sorby's suggestion to construct fire-proof floors with a stout timber-framed floor, filled in with or embedded in Dennett's concrete, says that the floor-plaster which is used as the binding material of that concrete would, in the event of a fire, calcine with the heat, and burst on the application of water.

Floor-plaster is, as "Y." states, a preparation of the coarse gypsum rock; but, instead of being merely roasted or boiled, as the ordinary plaster of Paris is usually prepared, it is thoroughly calcined in kilns.

Concrete, or other compositions mixed therewith, present greater resistance to fire than any cements prepared from carbonate of lime (ordinary limestone), and this results from the greater affinity which exists between the

chemical constituents of gypsum, viz., sulphuric acid and lime.

Of course, any material used for building purposes may be injured, and practically destroyed, by a fire of sufficient intensity and duration, but certain materials may be selected in preference to others for their fire-resisting qualities and convenience of application.

In my opinion, Dennett's concrete fulfils these conditions. It may be applied in a variety of ways, to suit constructive and decorative requirements, and the highly-calcined gypsum, which forms its binding element, has great fire-resisting power, as well as being one of the best non-conductors of heat, and hence forms an effective protection from the action of fire on the wood or iron portions of the construction.

Floor-plaster has been, as your correspondent states, extensively used for forming bed-room floors, in the gypsum districts. It is floated 2 in. or 3 in. thick on reeds or laths laid over ordinary joists. Previously to the last twenty years, it was almost exclusively used for this purpose in Nottingham and the neighbouring towns, and fires in dwelling-houses were of the rarest occurrence; being in direct contrast to their frequency since the ordinary boarded floors have been commonly used in those districts.

I am therefore of opinion that gypsum cement or concrete, properly applied, is a most valuable material for the construction of fire-proof floors; and I should be glad to see its use extended, and the iron or wood girders and stancheons fully encased with the material, these really being the weak points, as proved by recent experience of so-called fireproof buildings. CHARLES BAILY.

GAS LIGHTING.

THE method of lighting gas by galvanism, patented by Mr. J. B. Booth, of Preston, and already noticed in our columns, has now been more fully described in a local paper:—

"The apparatus constituting the invention looks like a moderately-sized globular inkstand of glass, surmounted by a tube of the same material, with a metallic top; and by screwing off the burner it can be very easily attached to any lamp, chandelier-pipe, or ordinary gas-jet. The base or globular portion is filled with a deep red-coloured liquid,—a simple chemical mixture, with no combustible properties, almost without smell, and so cheap that three-pennyworth of it will serve one lamp for twelve months. Over this liquid, and within the glass tube there is a plate of zinc, with a piece of graphite, or gas-coal, and between these and a thin coiled platinum wire, fixed over the cap of the general vessel, into which a gas-burner is inserted, galvanism is obtained. Ignition is effected in the following way:—A pipe to be screwed to that up which the ordinary gas-supply flows runs through the base of the vessel to about the centre of the surmounting tube; pressure brought to bear upon the gas in this pipe causes, by some collateral openings, a simultaneous depression upon the chemical solution which occupies a lower level in two side-tubes; the gas occupies the vacuum caused by the displaced liquid, and ascends to a higher chamber in connexion with the burner, while the displaced liquid is pressed into two side-tubes effecting contact with the zinc and graphite, generating galvanic activity, which is communicated to the wire, and exciting the catalytic power of the wire, which, when exposed to the ascending jet of gas, results in immediate, almost instantaneous, ignition. The mechanism is of the simplest construction, and can be applied to any kind or number of gas-pipes, either remote from or proximate to the works, to street as well as to office or shop lamps, and the light can be extinguished as easily as it can be ignited."

Successful experiments with it have, it is said, been recently made at the Preston Gasworks.

We may here incidentally express our hope that the metropolitan gas companies will not quite exhaust the patience and the sympathies of the public. Their gas has not been good for years, but it still continues, to our experience, in the almost unusable state in which the ex-stokers left it, although it is now full time it were at least as good as it was before they went off.

THE EMBANKMENT AND THE THAMES.

SIR,—It is a source of great regret to all who visit the Embankment of the Thames to see that it should present such an unsightly *growth of green* upon the granite-surfaced walls towards the river. The very bearded mask of Father Thames over Essex façade seems to regret that its waters, bad as these may be, should be so encompassed. Nay, further, the insidious seeds of the mosses and fungi tend every year to increase to such a growth that in less than two generations others will see the mica has left large pits, recording the gradual but certain wreck that is being made. Our ancient marbles owe their existence to the present day, for our edification, wholly from the circumstances of that "which was worth doing well was well done,"—that was, by thoroughly polishing the surfaces. Now, if this could be done, as I hold it can, with great advantage and effect, these seeds could be precluded from nestling on the granite ground wherein they germinate. Not only does each cavity give a safe lodgment, but it is also a retaining source of moisture that helps to grow these "greens."

Portland Harbour has had its crowning stone put on in a most princely manner, and is so far considered to be completed. Why should not some of the best convict labour be employed, as a national work, to polish up the basin of the Thames? In proposing such, it is in conformity with that which we are now solving,—to make such men learn to earn their livelihood by fair means,—a thing in time telling as a double good. We have sand at our feet for the purpose, with such steam appliances as should reduce the excessive labour, and repay for effective undertaking, thus giving satisfaction to ourselves, as it might hereafter to that unknown "New Zealander" who may visit and view from the bridges the bright and classic works of ancient days. HENRY GRAFTON, C.E.

A BRIBE.

"TO ARCHITECTS."—A liberal '*cash in advance*' share of commission is offered by an experienced quantity surveyor, having offices in the City, upon all work placed in his hands. Highest references for efficient and expeditious performance of work.—Address, 'Surveyor,' 16, Lothian-road, Camberwell New-road, London, S.E."

Sir,—The above disgusting circular has been sent to me as "F.R.I.B.A.," and I forward it to you for public reprobation. Doubtless the quasi-surveyor has got hold of a list of the members of our Institute, and is endeavouring to catch a few gudgeons. He is, to a certain extent, wise in his generation; for he naturally omits to offer the highest or any reference for integrity.

HENRY BAKER.

No. 108, *Gower-street.*

GROINED RECESS AT THE EAST END OF FAIRSTED CHURCH, ESSEX.

SIR,—A clergyman has recently sent me a sketch of a groined niche recently discovered in the above church. It is formed in the thickness of the main wall, and was entirely concealed by lath and plaster, and much mutilated. He is desirous of knowing to what purpose it was formerly assigned. Could it have been a shrine to the Virgin? or can any of your readers assign any other purpose for it?

The new pulpit is placed within it at present (which, by the way, might give a useful hint for such a purpose in modern churches, and would *assist sound*). W. B. W.

THE RAILWAY-ARCH QUESTION.

PROCEEDINGS AGAINST THE SOUTH-EASTERN COMPANY.

THE nuisance arising from the percolation of water through the arches of the several railway companies crossing the thoroughfares in South London was last week again under the consideration of one of the local boards. It appears that the St. Saviour's Board of Works having been unsuccessful in their endeavours to induce the South-Eastern Company to remedy the evil complained of, as regards the arches and bridges on their line, have resolved to prefer a bill of indictment against the company, with respect to the bridges crossing over the Borough, in High-street, Southwark-street, and Blackfriars-road. Similar proceedings have already been taken against the London, Chatham, and Dover and the South-Western Companies by the Lambeth and Wandsworth Vestries, but now stand over, in order to allow the respective companies to execute promised improvements at the bridges connected with their lines.

THE ARCHITECTURAL UNION COMPANY.

THE report submitted at the fifteenth ordinary general meeting of shareholders, held at their house, 9, Conduit-street, on the 4th inst., showed that the galleries and premises generally have been profitably occupied during the past year. The number of shares on the register remains the same as last year, viz., 1,037, upon which 10,370*l.* have been paid, and the directors were able to recommend the payment of a dividend of 11*s.* per share, free of income-tax, amounting to 570*l.* 7*s.*, leaving (in addition to 21*l.* 12*s.* belonging to the auxiliary donation fund, and 7*l.* 8*s.* 3*d.* unclaimed dividends) a balance in hand of 292*l.* 5*s.*, of which 49*l.* are set apart to meet the fine of 98*l.* due every fourteen years (payable in March, 1880), and 243*l.* 5*s.* are carried forward to the next account. This the meeting confirmed. We hear with sincere regret that Mr. Charles Mayhew has been compelled to withdraw from the direction in consequence of ill-health. Professor Hayter Lewis has been chosen to fill the vacancy in the board thus occasioned.

ST. PAUL'S CATHEDRAL.

SIR,—Will you allow me to suggest to the Dean and Chapter of St. Paul's, through the medium of your columns, that the *reading* minor canon, in order to be *distinctly* audible to the congregation, should sit immediately below the Dean's or Archdeacon's seat? Last Saturday afternoon I attended the service, when a gentleman with stentorian voice, but not a particle of articulation, intoned the prayers from, I think, the Treasurer's stall, and the result was that, to the congregation, these and the exhortation consisted of one terribly long dreary monotone, most provocative of sleep. Were the plan followed out that I suggest, it would be simply a return to the ancient custom, when the minor canons, as part of the choir, always sat in a line with the vicars choral. The labelling of certain stalls, "Minor Canonicus i.," "Minor Canonicus ii.," up to twelve, is a modern invention; it only dates from the time when the organ-screen was removed from the entrance to the choir.

X. Y. Z.

CHURCH-BUILDING NEWS.

Wotton-under-Edge.—The church at Kingswood, Wotton-under-Edge, has been re-opened. The present additions, reparations, &c., comprise at the entrance at the west end the removal of a pair of Tuscan columns, connected with a spandrel top, and in its place a porch has been erected, glazed on each side, and standing on a stone plinth, with overhanging eaves and gable ends, tiled with Broseley tiles, and having double entrance-doors. Inside the porch are glazed doors to the church. At the angle of the chancel and transept an organ-chamber, about 17 ft. by 13 ft., has been built. Access to this is gained by ascending a few steps, and underneath is the vestry, to supply the one taken down. The latter is reached by a few steps down from the chancel. Owing to the damp in the new work, the organ is not yet put into its place. The organ-pipes will face the chancel, which part is wholly open, except a low balustrade of varnished deal and red cloth panels. One of the windows which has been taken in from the transept for the building of the organ-loft has been filled with open ornamental trellis-work, instead of glass, and serves to allow the sound of the organ to fill the church. The rest of the windows which had not been re-glazed are now being completed, the two in the east end having, together with stained glass, the emblem of the Holy Trinity; also emblems of Alpha and Omega, the monogram I.H.S., and other designs in coloured glass. The chancel and the sacrarium have also been raised, the latter forming five sides of an octagon. The front side, elongated, come out from the east wall. The altar and the lectern in oak, are from the church of Dursley. The whole of the church has been re-pewed. The cost of this has been about 350*l.* Mr. C. P. Pritchet, of Wotton, architect, gave his services to the work. Mr. Hart was the carpenter; Mr. Lovell, the mason; and Mr. Bruton, the plasterer, &c., all of Kingswood; and Mr. Dauncey, of Wotton, was the plumber, glazier, and painter.

Westbromwich.—The works in connexion with the restoration of All Saints' Church having been so far completed, the reopening and dedication festival services have been held. The total cost of the alteration and restoration will be 7,000*l.*, towards which about 5,000*l.* have been realised. This is the fourth church which has occupied the same site, and the last church which has been demolished was inconvenient, out of repair, and inadequate for the requirements of the district, and hence, about the middle of last year, the restoration and enlargement were decided upon. The tower of the old church, which was erected chiefly in the fourteenth and fifteenth centuries, has been retained, but now forms the extremity of the southern aisle. The general plan is very similar to that of the older building, saving that the single aisle is now on the south side instead of on the north. The nave is 92 ft. in length and 30 ft. in breadth; the chancel is 26 ft. wide and 43 ft. long; the total internal length of the church being 135 ft. On the south side of the chancel is a side chapel, forming a chancel to the south aisle, which is of equal length with the nave, and 14 ft. in width. This portion of the church will be more particularly appropriated to the daily services. As in the older church, there is an aisle on one side of the nave only. The western end of the south aisle is terminated by the old arch leading into the tower, an arch which was always intended to form a leading feature in the architecture of the building. The

Is not the Institute regarded as an Institute of meddlesome people continually interfering with the business of others, and fancying itself slighted by those who decline or resent its advice?

Is it not obvious that we are gradually arraying the public bodies against us? That by trumpeting forth our honesty, integrity, and self-sacrificing qualities, we are suggesting the opposite ideas?

These are signs of the times that it would be well to take to heart; and if, instead of cavilling at the outside world, who need our services, but distrust our capacity, we were to talk a little less, and study a little more, we should leave less room for builders and upholsterers to practise architecture and build, as they do, some of the largest mansions for the "upper ten."

It would be interesting to know how many of the 250 Fellows of the R.I.B.A. write their own specifications, or are capable of doing it. Quantity surveyors and builders will bear me out in this dubious point. These are the men who aspire to be arbiters on all disputed accounts, and to dictate to their brethren and to their employers what they shall do, and what they shall not do. I do not wish to cast any slur upon the "upper ten" of the Institute—their ability and high position are unquestioned, and lesser men feel a pride in being associated with them, and we never hear them cavilling on the question of competitions.

Let us leave trades-unionism to gas-stokers and building operatives, and note its results, but let us have *free trade:* merit needs no recommendation, or to be fenced about by bye-laws. If we must fight for our living, let us fight, and let those who cannot do so stand aside. We shall not always have to fight—some will get to the front. Let us, at all events, cease raving about our ill-treatment, and this unseemly quarrelling with our employers. THOS. CHAS. SORBY.

STREETS IMPROVEMENT.

SIR,—Whatever may eventually be the beauty or otherwise of the new offices now being built for the Provident Institution Savings' Bank, at the north end of St. Martin's-place, Charing-cross, it must strike all who pass that way (I am thankful I seldom have occasion to do so), that it is simply a blocking up of what ought to be a fine opening into St. Martin's-lane, and thus losing an opportunity for starting a wide street from Charing-cross to Oxford-street and Tottenham-court-road, which has so long been wanted, and much talked about.

The new buildings now being erected are certainly set back a few feet (say 7 or 8), from what was formerly the line of old houses; but what is this trifle compared with what ought to be done, viz.—the pulling down and setting back of all the west side of St. Martin's-lane, to form a street as wide as St. Martin's-place? I need not occupy any more space in arguing for so desirable an object, but must express wonder that it has not before been attended to by the proper authorities, whoever they may be.

W. H. E.

ARCHITECTURE AND CONCRETE BUILDING.

IN the report lately given in your journal of the meeting of the Northern Architectural Association, at which the discussion turned upon the uses of concrete in building, it is remarkable that points were raised which have, from time to time, been already ably discussed by various correspondents in your pages. Mr. Olliver, at the meeting referred to, remarked, "that assuming the adaptability and suitability of concrete for building purposes, it would yet remain destitute of æsthetic and architectural character, and that resort must still be had to stucco and painting." Now, this is just the one conclusion which your correspondents have pointed out need *not* be arrived at, but on the contrary, that if the durability of concrete *is* established as free from contraction and expansion, it offers a wide field for the employment of a mode of architectural decoration, already coming more and more into vogue, and which is yet destined, probably, to play a very important part in city or town architecture, with the best and most pleasing results. I refer, as in a former communication, to encaustic tiling, which would be admirably adapted for facing concrete buildings, whether as an internal or external decoration. What is sought at present for architectural effect in relief of parts, special features, and carved surfaces, but which is so ruinously thrown away under the dirt-producing and corroding influences of a city atmosphere, would be more than supplied by the gradation of colour, arrangement of pattern, &c., of which encaustic tile decoration would be susceptible. I am persuaded that one good, thoroughly *artistic* attempt at this would go a long way to initiate a much-desired change in our present overdone styles. The conditions of success, however, would be, first, to have good and simple *proportions* in the *mass* of the building, and in its *subordinate parts*, a sufficient variation of surfaces, *i.e.*, not all one dead level, and then a well-studied and skilful arrangement of colour and pattern in the tiling for the respective parts of the building. All should be of an *architectural* character, and designed and executed specially for the building in hand, and not selected merely from already made patterns, unless these fully answered to that *artistic thought* which we want to bring into all our architecture, and for the lack of which we have so much that has neither vitality nor originality. The beautiful patterns already produced in encaustic tiling for minor purposes show its thorough capability, as al
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President—Mr. B. Hannen (F
Vice-Presidents—Mr. C. Luca
G. F. Trollope (George Trollop
Treasurer—Mr. G. Dines (Di
Honorary Secretary—Mr. Stan
Committee—Messrs. W. Bra
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R. T.

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J. J. A.

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IN this case, tried at Manchester before Mr. Justice Mellor and a special jury, the plaintiff was an engine-driver on a travelling crane used by the defendants, a firm of builders in London, and the plaintiff's employers, to raise stones at the building of the new Town-hall in Manchester, for which they were the contractors; and he brought this action for the defendants' alleged negligence in respect of the state and condition of the crane, by reason of which it broke, and he, together with the engine, stone, and whole apparatus, were precipitated to the ground and suffered most serious injuries, by which he is

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I am therefore of opinion that gypsum cement or concrete, properly applied, is a most valuable material for the construction of fire-proof floors; and I should be glad to see its use extended, and the iron or wood girders and stancheons fully encased with the material, these really being the weak points, as proved by recent experience of so-called fireproof buildings. CHARLES BELL.

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A BRIBE.

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Sir,—The above disgusting circular has been sent to me as "F.R.I.B.A.," and I forward it to you for public reprobation. Doubtless the quasi- got hold of a list of the members nte, and is endeavouring to catch a as. He is, to a certain extent, wise ation; for he naturally omits to offer or any reference for integrity.

HENRY BAKER.

lower-street.

RECESS AT THE EAST END OF ISTED CHURCH, ESSEX.

lergyman has recently sent me a groined niche recently discovered in urch. It is formed in the thickness wall, and was entirely concealed by ster, and much mutilated. He is knowing to what purpose it was gned. Could it have been a shrine ? or can any of your readers assign pose for it?

ulpit is placed within it at present e way, might give a useful hint for se in modern churches, and would

W. B. W.

ILWAY-ARCH QUESTION.

AGAINST THE SOUTH-EASTERN COMPANY.

e arising from the percolation of the arches of the several railway sing the thoroughfares in South t week again under the considera- he local boards. It appears that 's Board of Works having been unsuccessful in their endeavours to induce the South-Eastern Company to remedy the evil complained of, as regards the arches and bridges on their line, have resolved to prefer a bill of indictment against the company, with respect to the bridges crossing over the Borough, in High-street, Southwark-street, and Blackfriars-road. Similar proceedings have already been taken against the London, Chatham, and Dover and the South-Western Companies by the Lambeth and Wandsworth Vestries, but now stand over, in order to allow the respective companies to execute promised improvements at the bridges connected with their lines.

THE ARCHITECTURAL UNION COMPANY.

THE report submitted at the fifteenth ordinary general meeting of shareholders, held at their house, 9, Conduit-street, on the 4th inst., showed that the galleries and premises generally have been profitably occupied during the past year. The number of shares on the register remains the same as last year, viz., 1,037, upon which 10,370*l.* have been paid, and the directors were able to recommend the payment of a dividend of 11s. per share, free of income-tax, amounting to 570*l.* 7s., leaving (in addition to 21*l.* 12s. belonging to the auxiliary donation fund, and 7*l.* 8s. 3d. unclaimed dividends) a balance in hand of 292*l.* 5s., of which 49*l.* are set apart to meet the fine of 98*l.* due every fourteen years (payable in March, 1880), and 243*l.* 5s. are carried forward to the next account. This the meeting confirmed. We hear with sincere regret that Mr. Charles Mayhew has been compelled to withdraw from the direction in consequence of ill-health. Professor Hayter Lewis has been chosen to fill the vacancy in the board thus occasioned.

ST. PAUL'S CATHEDRAL.

SIR,—Will you allow me to suggest to the Dean and Chapter of St. Paul's, through the medium of your columns, that the *reading* minor canon, in order to be *distinctly* audible to the congregation, should sit immediately below the Dean's or Archdeacon's seat? Last Saturday afternoon I attended the service, when a gentleman with stentorian voice, but not a particle of articulation, intoned the prayers from, I think, the Treasurer's stall, and the result was that, to the congregation, these and the exhortation consisted of one terribly long dreary monotone, most provocative of sleep. Were the plan followed out that I suggest, it would be simply a return to the ancient custom, when the minor canons, as part of the choir, always sat in a line with the vicars choral. The labelling of certain stalls, "Minor Canonicus i.," "Minor Canonicus ii.," up to twelve, is a modern invention; it only dates from the time when the organ-screen was removed from the entrance to the choir.

X. Y. Z.

CHURCH-BUILDING NEWS.

Wotton-under-Edge.—The church at Kingswood, Wotton-under-Edge, has been re-opened. The present additions, reparations, &c., comprise at the entrance at the west end the removal of a pair of Tuscan columns, connected with a spandrel top, and in its place a porch has been erected, glazed on each side, and standing on a stone plinth, with overhanging eaves and gable ends, tiled with Broseley tiles, and having double entrance-doors. Inside the porch are glazed doors to the church. At the angle of the chancel and transept an organ-chamber, about 17 ft. by 13 ft., has been built. Access to this is gained by ascending a few steps, and underneath is the vestry, to supply the one taken down. The latter is reached by a few steps down from the chancel. Owing to the damp in the new work, the organ is not yet put into its place. The organ-pipes will face the chancel, which part is wholly open, except a low balustrade of varnished deal and red cloth panels. One of the windows which has been taken in from the transept for the building of the organ-loft has been filled with open ornamental trellis-work, instead of glass, and serves to allow the sound of the organ to fill the church. The rest of the windows which had not been re-glazed are now being completed, the two in the east end having, together with stained glass, the emblem of the Holy Trinity; also emblems of Alpha and Omega, the monogram I.H.S., and other designs in coloured glass. The chancel and the sacrarium have also been raised, the latter forming five sides of an octagon. The front side, elongated, come out from the east wall. The altar and the lectern in oak, are from the church of Dursley. The whole of the church has been re-pewed. The cost of this has been about 350*l.* Mr. C. P. Pritchet, of Wotton, architect, gave his services to the work. Mr. Hart was the carpenter; Mr. Lovell, the mason; and Mr. Bruton, the plasterer, &c., all of Kingswood; and Mr. Dauncey, of Wotton, was the plumber, glazier, and painter.

Westbromwich.—The works in connexion with the restoration of All Saints' Church having been so far completed, the reopening and dedication festival services have been held. The total cost of the alteration and restoration will be 7,000*l.*, towards which about 5,000*l.* have been realised. This is the fourth church which has occupied the same site, and the last church which has been demolished was inconvenient, out of repair, and inadequate for the requirements of the district, and hence, about the middle of last year, the restoration and enlargement were decided upon. The tower of the old church, which was erected chiefly in the fourteenth and fifteenth centuries, has been retained, but now forms the extremity of the southern aisle. The general plan is very similar to that of the older building, saving that the single aisle is now on the south side instead of on the north. The nave is 92 ft. in length and 30 ft. in breadth; the chancel is 26 ft. wide and 43 ft. long; the total internal length of the church being 135 ft. On the south side of the chancel is a side chapel, forming a chancel to the south aisle, which is of equal length with the nave, and 14 ft. in width. This portion of the church will be more particularly appropriated to the daily services. As in the older church, there is an aisle on one side of the nave only. The western end of the south aisle is terminated by the old arch leading into the tower, an arch which was always intended to form a leading feature in the architecture of the building. The

Is not the Institute regarded as an Institute of meddlesome people continually interfering with the business of others, and fancying itself slighted by those who decline or resent its advice?

Is it not obvious that we are gradually arraying the public bodies against us? That by trumpeting forth our honesty, integrity, and self-sacrificing qualities, we are suggesting the opposite ideas?

These are signs of the times that it would be well to take to heart; and if, instead of cavilling at the outside world, who need our services, but distrust our capacity, we were to talk a little less, and study a little more, we should leave less room for builders and upholsterers to practise architecture and build, as they do, some of the largest mansions for the "upper ten."

It would be interesting to know how many of the 250 Fellows of the R.I.B.A. write their own specifications, or are capable of doing it. Quantity surveyors and builders will bear me out in this dubious point. These are the men who aspire to be arbiters on all disputed accounts, and to dictate to their brethren and to their employers what they shall do, and what they shall not do. I do not wish to cast any slur upon the "upper ten" of the Institute—their ability and high position are unquestioned, and lesser men feel a pride in being associated with them, and we never hear them cavilling on the question of competitions.

Let us leave trades-unionism to gas-stokers and building operatives, and note its results, but let us have *free trade:* merit needs no recommendation, or to be fenced about by bye-laws. If we must fight for our living, let us fight, and let those who cannot do so stand aside. We shall not always have to fight—some will get to the front. Let us, at all events, cease raving about our ill-treatment, and this unseemly quarrelling with our employers. THOS. CHAS. SORBY.

STREETS IMPROVEMENT.

SIR,—Whatever may eventually be the beauty or otherwise of the new offices now being built for the Provident Institution Savings' Bank, at the north end of St. Martin's-place, Charing-cross, it must strike all who pass that way (I am thankful I seldom have occasion to do so), that it is simply a blocking up of what ought to be a fine opening into St. Martin's-lane, and thus losing an opportunity for starting a wide street from Charing-cross to Oxford-street and Tottenham-court-road, which has so long been wanted, and much talked about.

The new buildings now being erected are certainly set back a few feet (say 7 or 8), from what was formerly the line of old houses; but what is this trifle compared with what ought to be done, viz.—the pulling down and setting back of all the west side of St. Martin's-lane, to form a street as wide as St. Martin's-place? I need not occupy any more space in arguing for so desirable an object, but must express wonder that it has not before been attended to by the proper authorities, whoever they may be.

W. H. E.

ARCHITECTURE AND CONCRETE BUILDING.

IN the report lately given in your journal of the meeting of the Northern Architectural Association, at which the discussion turned upon the uses of concrete in building, it is remarkable that points were raised which have, from time to time, been already ably discussed by various correspondents in your pages. Mr. Olliver, at the meeting referred to, remarked, "that assuming the adaptability and suitability of concrete for building purposes, it would yet remain destitute of æsthetic and architectural character, and that resort must still be had to stucco and painting." Now, this is just the one conclusion which your correspondents have pointed out need *not* be arrived at, but on the contrary, that if the durability of concrete *is* established as free from contraction and expansion, it offers a wide field for the employment of a mode of architectural decoration, already coming more and more into vogue, and which is yet destined, probably, to play a very important part in city or town architecture, with the best and most pleasing results. I refer, as in a former communication, to encaustic tiling, which would be admirably adapted for facing concrete buildings, whether as an internal or external decoration. What is sought at present for architectural effect in relief of parts, special features, and carved surfaces, but which is so ruinously thrown away under the dirt-producing and corroding influences of a city atmosphere, would be more than supplied by the gradation of colour, arrangement of pattern, &c., of which encaustic tile decoration would be susceptible. I am persuaded that one good, thoroughly *artistic* attempt at this would go a long way to initiate a much-desired change in our present overdone styles. The conditions of success, however, would be, first, to have good and simple *proportions* in the *mass* of the building, and in its *subordinate parts*, a sufficient variation of surfaces, *i.e.*, not all one dead level, and then a well-studied and skilful arrangement of colour and pattern in the tiling for the respective parts of the building. All should be of an *architectural* character, and designed and executed specially for the building in hand, and not selected merely from already made patterns, unless these fully answered to that *artistic thought* which we want to bring into all our architecture, and for the lack of which we have so much that has neither vitality nor originality. The beautiful patterns already produced in encaustic tiling for minor purposes show its thorough capability, as also the remarkable skill and success in design and colour which this species of English art has attained to. Its variety and extended use are endless, and need not stop short of all here indicated as a most pleasing and effective exterior decoration, which would have the charm of novelty, variety, light, and cleanliness, in a remarkable degree, and which would set at rest for ever all questions of decay of material, recleaning, or repainting, which at present afflict all city architecture.

NEMO.

GENERAL ASSOCIATION OF MASTER BUILDERS OF LONDON.

THE first general meeting of this Association was held on Tuesday last, at the Westminster Palace Hotel, Mr. Hannen in the chair, and was well and influentially attended. A code of rules, previously prepared by a committee, was adopted, and the following were elected officers and committee:—

President—Mr. B. Hannen (Holland & Hannen).
Vice-Presidents—Mr. C. Lucas (Lucas, Brothers); Mr. G. F. Trollope (George Trollope & Sons).
Treasurer—Mr. G. Dines (Dines & Banderet).
Honorary Secretary—Mr. Stanley G. Bird.
Committee—Messrs. W. Brass, B. Colls (B. Colls & Sons), F. Dove (Dove, Brothers), J. M. Hawkins (Henshaw & Co.), T. R. Hill (Hill & Sons), Horner (Ashby & Horner), C. W. Jackson (Jackson & Shaw), J. M. Macey, Manley (Manley & Rogers), G. Myers (Myers & Son), T. F. Rider (Rider & Son), Robinson (Brown & Robinson), Scrivener (Scrivener & White), J. Sewell (Sewell & Sons), H. G. Smith (G. Smith & Co.), Waller (Waller & Son).

The Association at present consists of 352 members, usually employing about 33,000 men.

HINTS TAKEN.

SOME of my letters to the *Builder* are doing good for the public, viz., public-house traps are being renewed without the conical stand-up hobnails; coal-cellar plates are receiving attention; india-rubber scrapers are now used in the City to clean the pavements; the rotary blast-fan is being adopted in coal-mines; gluey water for watering streets; and many other suggestions of mine that have appeared in the *Builder*. Thanks to Mr. Editor, or my ideas would never have been known.

R. T.

HIGH WAGES AND LOW LIVING *VERSUS* LOW WAGES AND HIGH LIVING.

SIR,—Wandering through a portion of a neighbouring town the other day, where every house in the locality is occupied by members of the working class, I could not help being struck by the appearance of the residences of men earning nearly two pounds a week, and contrasting it unfavourably with the homes of the many underpaid clerks and assistants, professional and otherwise (whose income is about the same as the above), or the homes of the much-pitied agricultural labourer, who earns a half, a third, and in some cases a fourth, of the wages of the skilled labourer.

In the first case, we find neglected rows of tenements, mostly dirty, ill-conditioned, unsavoury, and unsanitary within and without, in keeping with the personal appearance of the women and children. In the second, rows of well-kept dwellings, at a moderate rent, in a "cheap" suburb, neatly furnished, with an appearance of comfort, not forgetting the sometimes objectionable piano, suggestive of evening amusement. The third case offers, except where generous landlords have been content to receive a very small return for a very large outlay, a cottage dwelling, often aptly termed a "hovel," yet so tidy, and so made the most of that the interior at least is generally sweet, clean, and inviting.

Why will the skilled workman, with these examples before him, disgrace himself by living as he does? His answer may be, "We cannot get buildings to live in in which we can take a pride;" to which I reply, "It is not so. 'Bad workmen quarrel with their tools.' It is not speculative building; all alike suffer from that curse. *It is in the method of keeping them in order.*"

It is true the clerks and assistants aforesaid do not pay tribute to the "union," nor are they liable to all the sucking processes of that excellent institution, neither do they go on strike or often get intoxicated, but they are obliged by the position they hold to dress themselves and their families decently, and keep their homes respectably, on 100*l.* a year in most cases. Again, I ask, why cannot the working man do the same? Is it from want of proper education or of that refinement, as necessary to the individual who forms a unit in any civilised society as it is to the character of the work put into his hand? Is it quite impossible for him to rise from his self-degradation, purify his conversation, and improve his mind in these times of "shorter hours" and "higher pay?"

J. J. A.

BUILDERS' RESPONSIBILITIES.

PEARSON *v.* JOHNSON AND ANOTHER.

IN this case, tried at Manchester before Mr. Justice Mellor and a special jury, the plaintiff was an engine-driver on a travelling crane used by the defendants, a firm of builders in London, and the plaintiff's employers, to raise stones at the building of the new Town-hall in Manchester, for which they were the contractors; and he brought this action for the defendants' alleged negligence in respect of the state and condition of the crane, by reason of which it broke, and he, together with the engine, stone, and whole apparatus, were precipitated to the ground and suffered most serious injuries, by which he is rendered a cripple. The alleged imperfection in the crane lay in the rottenness of the "beam," which the plaintiff and his witnesses said was evidenced by a crack which was noticed in it some time prior to the accident, and was known to several of the plaintiff's fellow-workmen, and also to the managers of the works in Manchester.

At the end of the plaintiff's case the defendants' counsel applied for a nonsuit, on the ground that there was no personal negligence in the defendants themselves, which was necessary to render them liable to their servant in an action for negligence; and that in respect to saddling their employers with liability for negligence, superintendents or managers of works are but fellow-servants with those engaged upon the works themselves, and the masters cannot be made answerable for the results of their negligence to a workman. He cited "Wilson *v.* Merry" (*Law Report* 1, *Scotch Appeals* 327), "Feltham *v.* England" (*Law Report* 2, *Queen's Bench* 33), and other cases.

The judge declined to stop the case, but gave the counsel leave to move upon the point.

The latter then said that the plaintiff's injuries were so serious that he would not seek to alter the view of the facts spoken to as the origin of the accident; but he would call the two managers of the works with a view to showing that their position was in reality only subordinate. This was done, and the jury assessed the damages at 500*l.*, that being the only question left to them.

RESPONSIBILITY OF BUILDING COMMITTEES.

IN the Court of Common Pleas, Dec. 2 (sittings at Nisi Prius, in Middlesex, before Mr. Justice Keating and a special jury), the case of Whillier *v.* Roberts and Others, came on.

The plaintiff in this case was a builder in the City, and he sued the members of the building committee of Christ Church, Lower Clapton, to recover 27*l.* 2*s.*, balance due for the work done in erecting that structure. All the members of the committee suffered judgment by default except Mr. Roberts, who disputed his liability.

The evidence for the plaintiff was that Mr. Roberts had attended two meetings of the committee, and at one of them, held on the 20th of November, 1869, he seconded a resolution that the secretary be directed to communicate with Messrs. Whigginton & Morris that their plan for building the church was accepted, subject to certain terms and alterations. One of the terms was, that the contract should not be for more than 5,500*l.* The contract actually entered into was for 5,565*l.*, and the cost of the building, including extras, was 6,624*l.* 2*s.*, of which all but the balance now claimed had been paid, a large part by members of the committee. It further appeared that Mr. Roberts had early retired from the committee.

Mr. Garth submitted that there was no case for the jury, because Mr. Roberts was no party to the contract for 5,500*l.* More than this amount had been paid.

Mr. Justice Keating said that he would leave the case to the jury, but reserve the question of law for the full Court.

The case for the defendant was that the church was to be paid for by subscriptions, the committee incurring no personal responsibility.

Mr. Justice Keating, in summing up, said that the question was whether the defendant had held himself out, or had authorised other people to hold him out, as liable to pay the sum claimed.

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I am therefore of opinion that gypsum cement or concrete, properly applied, is a most valuable material for the construction of fire-proof floors; and I should be glad to see its use extended, and the iron or wood girders and stancheons fully encased with the material, these really being the weak points, as proved by recent experience of so-called fireproof buildings. CHARLES BAILY.

GAS LIGHTING.

THE method of lighting gas by galvanism, patented by Mr. J. B. Booth, of Preston, and already noticed in our columns, has now been more fully described in a local paper:—

"The apparatus constituting the invention looks like a moderately-sized globular inkstand of glass, surmounted by a tube of the same material, with a metallic top; and by screwing off the burner it can be very easily attached to any lamp, chandelier-pipe, or ordinary gas-jet. The base or globular portion is filled with a deep red-coloured liquid,—a simple chemical mixture, with no combustible properties, almost without smell, and so cheap that three-pennyworth of it will serve one lamp for twelve months. Over this liquid, and within the glass tube there is a plate of zinc, with a piece of graphite, or gas-coal, and between these and a thin coiled platinum wire, fixed over the cap of the general vessel, into which a gas-burner is inserted, galvanism is obtained. Ignition is effected in the following way:—A pipe to be screwed to that up which the ordinary gas-supply flows runs through the base of the vessel to about the centre of the surmounting tube; pressure brought to bear upon the gas in this pipe causes, by some collateral openings, a simultaneous depression upon the chemical solution which occupies a lower level in two side-tubes; the gas occupies the vacuum caused by the displaced liquid, and ascends to a higher chamber in connexion with the burner, while the displaced liquid is pressed into two side-tubes effecting contact with the zinc and graphite, generating galvanic activity, which is communicated to the wire, and exciting the catalytic power of the wire, which, when exposed to the ascending jet of gas, results in immediate, almost instantaneous, ignition. The mechanism is of the simplest construction, and can be applied to any kind or number of gas-pipes, either remote from or proximate to the works, to street as well as to office or shop lamps, and the light can be extinguished as easily as it can be ignited."

Successful experiments with it have, it is said, been recently made at the Preston Gasworks.

We may here incidentally express our hope that the metropolitan gas companies will not quite exhaust the patience and the sympathies of the public. Their gas has not been good for years, but it still continues, to our experience, in the almost unusable state in which the ex-stokers left it, although it is now full time it were at least as good as it was before they went off.

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SIR,—It is a source of great regret to all who visit the Embankment of the Thames to see that it should present such an unsightly *growth of green* upon the granite-surfaced walls towards the river. The very bearded mask of Father Thames over Essex façade seems to regret that its waters, bad as these may be, should be so encompassed. Nay, further, the insidious seeds of the mosses and fungi tend every year to increase to such a growth that in less than two generations others will see the mica has left large pits, recording the gradual but certain wreck that is being made. Our ancient marbles owe their existence to the present day, for our edification, wholly from the circumstances of that "which was worth doing well was well done,"—that was, by thoroughly polishing the surfaces. Now, if this could be done, as I hold it can, with great advantage and effect, these seeds could be precluded from nestling on the granite ground wherein they germinate. Not only does each cavity give a safe lodgment, but it is also a retaining source of moisture that helps to grow these "greens."

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Sir,—The above disgusting circular has been sent to me as "F.R.I.B.A.," and I forward it to you for public reprobation. Doubtless the quasi-surveyor has got hold of a list of the members of our Institute, and is endeavouring to catch a few gudgeons. He is, to a certain extent, wise in his generation; for he naturally omits to offer the highest or any reference for integrity.

HENRY BAKER.

No. 108, *Gower-street.*

GROINED RECESS AT THE EAST END OF FAIRSTED CHURCH, ESSEX.

SIR,—A clergyman has recently sent me a sketch of a groined niche recently discovered in the above church. It is formed in the thickness of the main wall, and was entirely concealed by lath and plaster, and much mutilated. He is desirous of knowing to what purpose it was formerly assigned. Could it have been a shrine to the Virgin? or can any of your readers assign any other purpose for it?

The new pulpit is placed within it at present (which, by the way, might give a useful hint for such a purpose in modern churches, and would *assist sound*). W. B. W.

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ST. PAUL'S CATHEDRAL.

SIR,—Will you allow me to suggest to the Dean and Chapter of St. Paul's, through the medium of your columns, that the *reading* minor canon, in order to be *distinctly* audible to the congregation, should sit immediately below the Dean's or Archdeacon's seat? Last Saturday afternoon I attended the service, when a gentleman with stentorian voice, but not a particle of articulation, intoned the prayers from, I think, the Treasurer's stall, and the result was that, to the congregation, these and the exhortation consisted of one terribly long dreary monotone, most provocative of sleep. Were the plan followed out that I suggest, it would be simply a return to the ancient custom, when the minor canons, as part of the choir, always sat in a line with the vicars choral. The labelling of certain stalls, "Minor Canonicus i.," "Minor Canonicus ii.," up to twelve, is a modern invention; it only dates from the time when the organ-screen was removed from the entrance to the choir.

X. Y. Z.

CHURCH-BUILDING NEWS.

Wotton-under-Edge.—The church at Kingswood, Wotton-under-Edge, has been re-opened. The present additions, reparations, &c., comprise at the entrance at the west end the removal of a pair of Tuscan columns, connected with a spandrel top, and in its place a porch has been erected, glazed on each side, and standing on a stone plinth, with overhanging eaves and gable ends, tiled with Broseley tiles, and having double entrance-doors. Inside the porch are glazed doors to the church. At the angle of the chancel and transept an organ-chamber, about 17 ft. by 13 ft., has been built. Access to this is gained by ascending a few steps, and underneath is the vestry, to supply the one taken down. The latter is reached by a few steps down from the chancel. Owing to the damp in the new work, the organ is not yet put into its place. The organ-pipes will face the chancel, which part is wholly open, except a low balustrade of varnished deal and red cloth panels. One of the windows which has been taken in from the transept for the building of the organ-loft has been filled with open ornamental trellis-work, instead of glass, and serves to allow the sound of the organ to fill the church. The rest of the windows which had not been re-glazed are now being completed, the two in the east end having, together with stained glass, the emblem of the Holy Trinity; also emblems of Alpha and Omega, the monogram I.H.S., and other designs in coloured glass. The chancel and the sacrarium have also been raised, the latter forming five sides of an octagon. The front side, elongated, come out from the east wall. The altar and the lectern in oak, are from the church of Dursley. The whole of the church has been re-pewed. The cost of this has been about 350*l.* Mr. C. P. Pritchet, of Wotton, architect, gave his services to the work. Mr. Hart was the carpenter; Mr. Lovell, the mason; and Mr. Bruton, the plasterer, &c., all of Kingswood; and Mr. Dauncey, of Wotton, was the plumber, glazier, and painter.

Westbromwich.—The works in connexion with the restoration of All Saints' Church having been so far completed, the reopening and dedication festival services have been held. The total cost of the alteration and restoration will be 7,000*l.*, towards which about 5,000*l.* have been realised. This is the fourth church which has occupied the same site, and the last church which has been demolished was inconvenient, out of repair, and inadequate for the requirements of the district, and hence, about the middle of last year, the restoration and enlargement were decided upon. The tower of the old church, which was erected chiefly in the fourteenth and fifteenth centuries, has been retained, but now forms the extremity of the southern aisle. The general plan is very similar to that of the older building, saving that the single aisle is now on the south side instead of on the north. The nave is 92 ft. in length and 30 ft. in breadth; the chancel is 26 ft. wide and 43 ft. long; the total internal length of the church being 135 ft. On the south side of the chancel is a side chapel, forming a chancel to the south aisle, which is of equal length with the nave, and 14 ft. in width. This portion of the church will be more particularly appropriated to the daily services. As in the older church, there is an aisle on one side of the nave only. The western end of the south aisle is terminated by the old arch leading into the tower, an arch which was always intended to form a leading feature in the architecture of the building. The

Is not the Institute regarded as an Institute of meddlesome people continually interfering with the business of others, and fancying itself slighted by those who decline or resent its advice?

Is it not obvious that we are gradually arraying the public bodies against us? That by trumpeting forth our honesty, integrity, and self-sacrificing qualities, we are suggesting the opposite ideas?

These are signs of the times that it would be well to take to heart; and if, instead of cavilling at the outside world, who need our services, but distrust our capacity, we were to talk a little less, and study a little more, we should leave less room for builders and upholsterers to practise architecture and build, as they do, some of the largest mansions for the "upper ten."

It would be interesting to know how many of the 250 Fellows of the R.I.B.A. write their own specifications, or are capable of doing it. Quantity surveyors and builders will bear me out in this dubious point. These are the men who aspire to be arbiters on all disputed accounts, and to dictate to their brethren and to their employers what they shall do, and what they shall not do. I do not wish to cast any slur upon the "upper ten" of the Institute—their ability and high position are unquestioned, and lesser men feel a pride in being associated with them, and we never hear them cavilling on the question of competitions.

Let us leave trades-unionism to gas-stokers and building operatives, and note its results, but let *us* have *free trade*: merit needs no recommendation, or to be fenced about by bye-laws. If we must fight for our living, let us fight, and let those who cannot do so stand aside. We shall not always have to fight—some will get to the front. Let us, at all events, cease raving about our ill-treatment, and this unseemly quarrelling with our employers. THOS. CHAS. SORBY.

STREETS IMPROVEMENT.

SIR,—Whatever may eventually be the beauty or otherwise of the new offices now being built for the Provident Institution Savings' Bank, at the north end of St. Martin's-place, Charing-cross, it must strike all who pass that way (I am thankful I seldom have occasion to do so), that it is simply a blocking up of what ought to be a fine opening into St. Martin's-lane, and thus losing an opportunity for starting a wide street from Charing-cross to Oxford-street and Tottenham-court-road, which has so long been wanted, and much talked about.

The new buildings now being erected are certainly set back a few feet (say 7 or 8), from what was formerly the line of old houses; but what is this trifle compared with what ought to be done, viz.—the pulling down and setting back of all the west side of St. Martin's-lane, to form a street as wide as St. Martin's-place? I need not occupy any more space in arguing for so desirable an object, but must express wonder that it has not before been attended to by the proper authorities, whoever they may be.

W. H. E.

ARCHITECTURE AND CONCRETE BUILDING.

IN the report lately given in your journal of the meeting of the Northern Architectural Association, at which the discussion turned upon the uses of concrete in building, it is remarkable that points were raised which have, from time to time, been already ably discussed by various correspondents in your pages. Mr. Olliver, at the meeting referred to, remarked, "that assuming the adaptability and suitability of concrete for building purposes, it would yet remain destitute of æsthetic and architectural character, and that resort must still be had to stucco and painting." Now, this is just the one conclusion which your correspondents have pointed out need *not* be arrived at, but on the contrary, that if the durability of concrete *is* established as free from contraction and expansion, it offers a wide field for the employment of a mode of architectural decoration, already coming more and more into vogue, and which is yet destined, probably, to play a very important part in city or town architecture, with the best and most pleasing results. I refer, as in a former communication, to encaustic tiling, which would be admirably adapted for facing concrete buildings, whether as an internal or external decoration. What is sought at present for architectural effect in relief of parts, special features, and carved surfaces, but which is so ruinously thrown away under the dirt-producing and corroding influences of a city atmosphere, would be more than supplied by the gradation of colour, arrangement of pattern, &c., of which encaustic tile decoration would be susceptible. I am persuaded that one good, thoroughly *artistic* attempt at this would go a long way to initiate a much-desired change in our present overdone styles. The conditions of success, however, would be, first, to have good and simple *proportions* in the *mass* of the building, and in its *subordinate parts*, a sufficient variation of surfaces, *i.e.*, not all one dead level, and then a well-studied and skilful arrangement of colour and pattern in the tiling for the respective parts of the building. All should be of an *architectural* character, and designed and executed specially for the building in hand, and not selected merely from already made patterns, unless these fully answered to that *artistic thought* which we want to bring into all our architecture, and for the lack of which we have so much that has neither vitality nor originality. The beautiful patterns already produced in encaustic tiling for minor purposes show its thorough capability, as also the remarkable skill and success in design and colour which this species of English art has attained to. Its variety and extended use are endless, and need not stop short of all here indicated as a most pleasing and effective exterior decoration, which would have the charm of novelty, variety, light, and cleanliness, in a remarkable degree, and which would set at rest for ever all questions of decay of material, recleaning, or repainting, which at present afflict all city architecture.

NEMO.

GENERAL ASSOCIATION OF MASTER BUILDERS OF LONDON.

THE first general meeting of this Association was held on Tuesday last, at the Westminster Palace Hotel, Mr. Hannen in the chair, and was well and influentially attended. A code of rules, previously prepared by a committee, was adopted, and the following were elected officers and committee:—

President—Mr. B. Hannen (Holland & Hannen).
Vice-Presidents—Mr. C. Lucas (Lucas, Brothers); Mr. G. F. Trollope (George Trollope & Sons).
Treasurer—Mr. G. Dines (Dines & Banderet).
Honorary Secretary—Mr. Stanley G. Bird.
Committee—Messrs. W. Brass, B. Colls (B. Colls & Sons), F. Dove (Dove, Brothers), J. M. Hawkins (Henshaw & Co.), T. R. Hill (Hill & Sons), Horner (Ashby & Horner), C. W. Jackson (Jackson & Shaw), J. M. Macey, Manley (Manley & Rogers), G. Myers (Myers & Son), T. F. Rider (Rider & Son), Robinson (Brown & Robinson), Scrivener (Scrivener & White), J. Sewell (Sewell & Sons), H. G. Smith (G. Smith & Co.), Waller (Waller & Son).

The Association at present consists of 352 members, usually employing about 33,000 men.

HINTS TAKEN.

SOME of my letters to the *Builder* are doing good for the public, viz., public-house traps are being renewed without the conical stand-up hobnails; coal-cellar plates are receiving attention; india-rubber scrapers are now used in the City to clean the pavements; the rotary blast-fan is being adopted in coal-mines; gluey water for watering streets; and many other suggestions of mine that have appeared in the *Builder*. Thanks to Mr. Editor, or my ideas would never have been known.

R. T.

HIGH WAGES AND LOW LIVING *VERSUS* LOW WAGES AND HIGH LIVING.

SIR,—Wandering through a portion of a neighbouring town the other day, where every house in the locality is occupied by members of the working class, I could not help being struck by the appearance of the residences of men earning nearly two pounds a week, and contrasting it unfavourably with the homes of the many underpaid clerks and assistants, professional and otherwise (whose income is about the same as the above), or the homes of the much-pitied agricultural labourer, who earns a half, a third, and in some cases a fourth, of the wages of the skilled labourer.

In the first case, we find neglected rows of tenements, mostly dirty, ill-conditioned, unsavoury, and unsanitary within and without, in keeping with the personal appearance of the women and children. In the second, rows of well-kept dwellings, at a moderate rent, in a "cheap" suburb, neatly furnished, with an appearance of comfort, not forgetting the sometimes objectionable piano, suggestive of evening amusement. The third case offers, except where generous landlords have been content to receive a very small return for a very large outlay, a cottage dwelling, often aptly termed a "hovel," yet so tidy, and so made the most of that the interior at least is generally sweet, clean, and inviting.

Why will the skilled workman, with these examples before him, disgrace himself by living as he does? His answer may be, "We cannot get buildings to live in in which we *can* take a pride;" to which I reply, "It is not so. 'Bad workmen quarrel with their tools.' It is not speculative building; all alike suffer from that curse. *It is in the method of keeping them in order.*"

It is true the clerks and assistants aforesaid do not pay tribute to the "union," nor are they liable to all the sucking processes of that excellent institution, neither do they go on strike or often get intoxicated, but they are obliged by the position they hold to dress themselves and their families decently, and keep their homes respectably, on 100*l.* a year in most cases. Again, I ask, why cannot the working man do the same? Is it from want of proper education or of that refinement, as necessary to the individual who forms a unit in any civilised society as it is to the character of the work put into his hand? Is it quite impossible for him to rise from his self-degradation, purify his conversation, and improve his mind in these times of "shorter hours" and "higher pay?"

J. J. A.

BUILDERS' RESPONSIBILITIES.

PEARSON V. JOHNSON AND ANOTHER.

IN this case, tried at Manchester before Mr. Justice Mellor and a special jury, the plaintiff was an engine-driver on a travelling crane used by the defendants, a firm of builders in London, and the plaintiff's employers, to raise stones at the building of the new Town-hall in Manchester, for which they were the contractors; and he brought this action for the defendants' alleged negligence in respect of the state and condition of the crane, by reason of which it broke, and he, together with the engine, stone, and whole apparatus, were precipitated to the ground and suffered most serious injuries, by which he is rendered a cripple. The alleged imperfection in the crane lay in the rottenness of the "beam," which the plaintiff and his witnesses said was evidenced by a crack which was noticed in it some time prior to the accident, and was known to several of the plaintiff's fellow-workmen, and also to the managers of the works in Manchester.

At the end of the plaintiff's case the defendants' counsel applied for a nonsuit, on the ground that there was no personal negligence in the defendants themselves, which was necessary to render them liable to their servant in an action for negligence; and that in respect to saddling their employers with liability for negligence, superintendents or managers of works are but fellow-servants with those engaged upon the works themselves, and the masters cannot be made answerable for the results of their negligence to a workman. He cited "Wilson *v.* Merry" (*Law Report* 1, *Scotch Appeals* 327), "Feltham *v.* England" (*Law Report* 2, *Queen's Bench* 33), and other cases.

The judge declined to stop the case, but gave the counsel leave to move upon the point.

The latter then said that the plaintiff's injuries were so serious that he would not seek to alter the view of the facts spoken to as the origin of the accident; but he would call the two managers of the works with a view to showing that their position was in reality only subordinate. This was done, and the jury assessed the damages at 500*l.*, that being the only question left to them.

RESPONSIBILITY OF BUILDING COMMITTEES.

IN the Court of Common Pleas, Dec. 2 (sittings at Nisi Prius, in Middlesex, before Mr. Justice Keating and a special jury), the case of Whillier *v.* Roberts and Others, came on.

The plaintiff in this case was a builder in the City, and he sued the members of the building committee of Christ Church, Lower Clapton, to recover 274*l.* 2*s.*, balance due for the work done in erecting that structure. All the members of the committee suffered judgment by default except Mr. Roberts, who disputed his liability.

The evidence for the plaintiff was that Mr. Roberts had attended two meetings of the committee, and at one of them, held on the 26th of November, 1869, he seconded a resolution that the secretary be directed to communicate with Messrs. Whigginton & Morris that their plan for building the church was accepted, subject to certain terms and alterations. One of the terms was, that the contract should not be for more than 5,500*l.* The contract actually entered into was for 5,565*l.*, and the cost of the building, including extras, was 6,624*l.* 2*s.*, of which all but the balance now claimed had been paid, a large part by members of the committee. It further appeared that Mr. Roberts had early retired from the committee.

Mr. Garth submitted that there was no case for the jury, because Mr. Roberts was no party to the contract for 5,500*l.* More than this amount had been paid.

Mr. Justice Keating said that he would leave the case to the jury, but reserve the question of law for the full Court.

The case for the defendant was that the church was to be paid for by subscriptions, the committee incurring no personal responsibility.

Mr. Justice Keating, in summing up, said that the question was whether the defendant had held himself out, or had authorised other people to hold him out, as liable to pay the sum claimed.

The jury, after an hour, found a verdict for the plaintiff, the defendant being liable in reference only to the original contract and the alterations necessary in it.

Leave was reserved to move to enter a verdict for the defendant, or a nonsuit, or to reduce the amount of the verdict.

FIRE-PROOF FLOORS.

SIR,—In the *Builder* of November 30th, your correspondent "Y.," commenting upon Mr. Sorby's suggestion to construct fire-proof floors with a stout timber-framed floor, filled in with or embedded in Dennett's concrete, says that the floor-plaster which is used as the binding material of that concrete would, in the event of a fire, calcine with the heat, and burst on the application of water.

Floor-plaster is, as "Y." states, a preparation of the coarse gypsum rock; but, instead of being merely roasted or boiled, as the ordinary plaster of Paris is usually prepared, it is thoroughly calcined in kilns.

Concrete, or other compositions formed therewith, present greater resistance to fire than any cements prepared from carbonate of lime (ordinary limestone), and this results from the greater affinity which exists between the

chemical constituents of gypsum, viz., sulphuric acid and lime.

Of course, any material used for building purposes may be injured, and practically destroyed, by a fire of sufficient intensity and duration, but certain materials may be selected in preference to others for their fire-resisting qualities and convenience of application.

In my opinion, Dennett's concrete fulfils these conditions. It may be applied in a variety of ways, to suit constructive and decorative requirements, and the highly-calcined gypsum, which forms its binding element, has great fire-resisting power, as well as being one of the best non-conductors of heat, and hence forms an effective protection from the action of fire on the wood or iron portions of the construction.

Floor-plaster has been, as your correspondent states, extensively used for forming bed-room floors, in the gypsum districts. It is floated 2 in. or 3 in. thick on reeds or laths laid over ordinary joists. Previously to the last twenty years, it was almost exclusively used for this purpose in Nottingham and the neighbouring towns, and fires in dwelling-houses were of the rarest occurrence; being in direct contrast to their frequency since the ordinary boarded floors have been commonly used in those districts.

I am therefore of opinion that gypsum cement or concrete, properly applied, is a most valuable material for the construction of fire-proof floors; and I should be glad to see its use extended, and the iron or wood girders and stancheons fully encased with the material, these really being the weak points, as proved by recent experience of so-called fireproof buildings. CHARLES BAILY.

GAS LIGHTING.

THE method of lighting gas by galvanism, patented by Mr. J. B. Booth, of Preston, and already noticed in our columns, has now been more fully described in a local paper:—

"The apparatus constituting the invention looks like a moderately-sized globular inkstand of glass, surmounted by a tube of the same material, with a metallic top; and by screwing off the burner it can be very easily attached to any lamp, chandelier-pipe, or ordinary gas-jet. The base or globular portion is filled with a deep red-coloured liquid,—a simple chemical mixture, with no combustible properties, almost without smell, and so cheap that three-pennyworth of it will serve one lamp for twelve months. Over this liquid, and within the glass tube there is a plate of zinc, with a piece of graphite, or gas-coal, and between these and a thin coiled platinum wire, fixed over the cap of the general vessel, into which a gas-burner is inserted, galvanism is obtained. Ignition is effected in the following way:—A pipe to be screwed to that up which the ordinary gas-supply flows runs through the base of the vessel to about the centre of the surmounting tube; pressure brought to bear upon the gas in this pipe causes, by some collateral openings, a simultaneous depression upon the chemical solution which occupies a lower level in two side-tubes; the gas occupies the vacuum caused by the displaced liquid, and ascends to a higher chamber in connexion with the burner, while the displaced liquid is pressed into two side-tubes effecting contact with the zinc and graphite, generating galvanic activity, which is communicated to the wire, and exciting the catalytic power of the wire, which, when exposed to the ascending jet of gas, results in immediate, almost instantaneous, ignition. The mechanism is of the simplest construction, and can be applied to any kind or number of gas-pipes, either remote from or proximate to the works, to street as well as to office or shop lamps, and the light can be extinguished as easily as it can be ignited."

Successful experiments with it have, it is said, been recently made at the Preston Gasworks.

We may here incidentally express our hope that the metropolitan gas companies will not quite exhaust the patience and the sympathies of the public. Their gas has not been good for years, but it still continues, to our experience, in the almost unusable state in which the ex-stokers left it, although it is now full time it were at least as good as it was before they went off.

THE EMBANKMENT AND THE THAMES.

SIR,—It is a source of great regret to all who visit the Embankment of the Thames to see that it should present such an unsightly *growth of green* upon the granite-surfaced walls towards the river. The very bearded mask of Father Thames over Essex façade seems to regret that its waters, bad as these may be, should be so encompassed. Nay, further, the insidious seeds of the mosses and fungi tend every year to increase to such a growth that in less than two generations others will see the mica has left large pits, recording the gradual but certain wreck that is being made. Our ancient marbles owe their existence to the present day, for our edification, wholly from the circumstances of that "which was worth doing well was well done,"—that was, by thoroughly polishing the surfaces. Now, if this could be done, as I hold it can, with great advantage and effect, these seeds could be precluded from nestling on the granite ground wherein they germinate. Not only does each cavity give a safe lodgment, but it is also a retaining source of moisture that helps to grow these "greens."

Portland Harbour has had its crowning stone put on in a most princely manner, and is so far considered to be completed. Why should not some of the best convict labour be employed, as a national work, to polish up the basin of the Thames? In proposing such, it is in conformity with that which we are now solving,—to make such men learn to earn their livelihood by fair means,—a thing in time telling as a double good. We have sand at our feet for the purpose, with such steam appliances as should reduce the excessive labour, and repay for effective undertaking, thus giving satisfaction to ourselves, as it might hereafter to that unknown "New Zealander" who may visit and view from the bridges the bright and classic works of ancient days. HENRY GRAFTON, C.E.

A BRIBE.

"TO ARCHITECTS."—A liberal '*cash in advance*' share of commission is offered by an experienced quantity surveyor, having offices in the City, upon all work placed in his hands. Highest references for efficient and expeditious performance of work.—Address, 'Surveyor,' 16, Lothian-road, Camberwell New-road, London, S.E."

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X. Y. Z.

CHURCH-BUILDING NEWS.

Wotton-under-Edge.—The church at Kingswood, Wotton-under-Edge, has been re-opened. The present additions, reparations, &c., comprise at the entrance at the west end the removal of a pair of Tuscan columns, connected with a spandrel top, and in its place a porch has been erected, glazed on each side, and standing on a stone plinth, with overhanging eaves and gable ends, tiled with Broseley tiles, and having double entrance-doors. Inside the porch are glazed doors to the church. At the angle of the chancel and transept an organ-chamber, about 17 ft. by 13 ft., has been built. Access to this is gained by ascending a few steps, and underneath is the vestry, to supply the one taken down. The latter is reached by a few steps down from the chancel. Owing to the damp in the new work, the organ is not yet put into its place. The organ-pipes will face the chancel, which part is wholly open, except a low balustrade of varnished deal and red cloth panels. One of the windows which has been taken in from the transept for the building of the organ-loft has been filled with open ornamental trellis-work, instead of glass, and serves to allow the sound of the organ to fill the church. The rest of the windows which had not been re-glazed are now being completed, the two in the east end having, together with stained glass, the emblem of the Holy Trinity; also emblems of Alpha and Omega, the monogram I.H.S., and other designs in coloured glass. The chancel and the sacrarium have also been raised, the latter forming five sides of an octagon. The front side, elongated, come out from the east wall. The altar and the lectern in oak, are from the church of Dursley. The whole of the church has been re-pewed. The cost of this has been about 350*l.* Mr. C. P. Pritchet, of Wotton, architect, gave his services to the work. Mr. Hart was the carpenter; Mr. Lovell, the mason; and Mr. Bruton, the plasterer, &c., all of Kingswood; and Mr. Dauncey, of Wotton, was the plumber, glazier, and painter.

Westbromwich.—The works in connexion with the restoration of All Saints' Church having been so far completed, the reopening and dedication festival services have been held. The total cost of the alteration and restoration will be 7,000*l.*, towards which about 5,000*l.* have been realised. This is the fourth church which has occupied the same site, and the last church which has been demolished was inconvenient, out of repair, and inadequate for the requirements of the district, and hence, about the middle of last year, the restoration and enlargement were decided upon. The tower of the old church, which was erected chiefly in the fourteenth and fifteenth centuries, has been retained, but now forms the extremity of the southern aisle. The general plan is very similar to that of the older building, saving that the single aisle is now on the south side instead of on the north. The nave is 92 ft. in length and 30 ft. in breadth; the chancel is 26 ft. wide and 43 ft. long; the total internal length of the church being 135 ft. On the south side of the chancel is a side chapel, forming a chancel to the south aisle, which is of equal length with the nave, and 14 ft. in width. This portion of the church will be more particularly appropriated to the daily services. As in the older church, there is an aisle on one side of the nave only. The western end of the south aisle is terminated by the old arch leading into the tower, an arch which was always intended to form a leading feature in the architecture of the building. The

altar, prominently raised upon a flight of five steps, occupies the main portion of the eastern wall of the sanctuary. The work has been carried out by Mr. C. Burkitt, of Wolverhampton.

Quarndon.—The foundation-stone of the new church here has been laid by Lady Scarsdale. The site is at the top of Quarndon, adjoining the new schools, and, when erected, the edifice will be seen for many miles round. It will consist of nave, two side-aisles, chancel, with organ-chamber and vestry, tower, and spire. The extreme length of the building is 82 ft., and width, 50 ft. The height of the tower and spire to the top of the vane will be 80 ft.; the height from the floor to the ridge will be 40 ft. The tower will be placed at the south-west angle, near to the high road. The entrance of the church will be through a porch on the right side. The vestry will be on the same side, having a separate entrance. Beneath will be the vault for the heating furnace. The land slopes very much towards the east end, so that under the chancel, &c., will be space for storage, if required. Under the floors will be arches throughout. The nave-roof is to be supported on each side by a series of stone moulded arches, with labels, on stone columns, and will be formed with framed principals and purlins; the spaces between showing as panels boarded and moulded, all being exposed to view. The chancel-roof is to be boarded under the timbers, and divided into panels. The roofs to aisles correspond with that of the nave. All the roofs are to be covered with Westmoreland slates. The sittings will be open benches placed on raised wooden floors, and the aisles paved with ornamental tiles. Accommodation is provided for 360 persons. The style is Gothic, of the fourteenth century. The design was prepared by Messrs. Giles & Brookhouse, architects; and the works are being carried out, under their direction, by Mr. Edwin Thompson, contractor, all of Derby.

Reading.—The first stone of the new parish church of St. John the Evangelist, Reading, has been laid. The architect is Mr. Dixon, and the builders are Messrs. Niblett & Son, of London.

Chesterton.—St. Chad's Mission School Church, Red-street, in the parish of Chesterton, has been opened. The building is in the Pointed style, and is built of red bricks, with blue brick facings, and will accommodate about 120 persons. It was designed by the builder, Mr. Wm. Lea, of Chesterton. The edifice comprises a school-room 35 ft. by 20 ft., with a chancel, which is raised two steps above the main room, and will be separated therefrom on week-days by a movable wooden frame-work, rising to the spring of the arch, and a class-room, which will also serve the purpose of a vestry on Sundays.

Gateshead.—Christ Church, in the parish of Gateshead, has been consecrated by the Bishop of Durham. The church was commenced about two years and a half ago, and was completed ready for use last November. But as no church can be consecrated on which there remains a debt, the promoters were obliged to ask the Bishop's consent to license it until the amount of the deficiency, some 1,500*l.* should have been raised. When this became known, Mr. Edward Joicey generously offered 700*l.*, and the balance was quickly obtained. The church is now entirely completed. It was designed by Messrs. Adams & Kelly, of Leeds, who have been employed by the Leeds Church Building Society. The roof, instead of being divided into bays or compartments, consists of uniform rafters, placed rather more closely to each other than usual. The east end is apsidal, with five tall gables, each containing a window. Beneath these is a reredos of Caen stone and marble, with panels containing the Commandments, creed, and the Lord's Prayer. The floor is laid by Sopwith, with parquetrie. The chancel stalls are carved, and the organ is contained in a case designed by the architects. Its chamber is on the south side of the chancel. The pulpit and desk are of Caen stone, carved, and relieved with pillars of different coloured marbles and stone. The carving was by Fielding & Dark, of Leeds. The Early English type has been adopted. A band of relieved carving is carried round the whole chancel above the reredos. The font is of carved Caen stone and marble. The windows contain some coloured devices, and are surrounded by floriated borders in colours. Those of the east and west gables are further ornamented, and the clearstory windows are of the same design. Messrs. A. Gibb & Co., of London, were the artists. The church is lighted at night by a row of gas-jets on either side at the level of the eaves, which runs from east to west, and the architects have run a porch across the whole western front, below the window. Over the central gable of the porch is carved a floriated cross with two guardian angels. A small light bell-turret rises at the north-west angle. The cost, exclusive of the ground, the organ, and other special gifts, has been 6,100*l.* Accommodation has been provided for 600 persons.

SCHOOL-BUILDING NEWS.

Hampton.—The corner stone of the new school at Hampton, near Evesham, has been laid. The site adjoins the village green, and the edifice will be in the Gothic style. The school will be built of red bricks, with stone dressings, and covered with Broseley tiles. The school-room will be 41 ft. long by 18 ft. wide. There will also be a class-room for infants, 18 ft. square. There are two tracery windows in the main school-room, and one in the class-room. Separate lavatories will be provided for the boys and girls, and over the former there will be a wooden bell-cot. The gables are finished with ornamental barge-boards and turned wood finials. There will be good playgrounds for boys and girls. A teacher's residence will be erected; the lower portion will be of red brick, and the upper part will be in half-timbered work with oriel window. The school will provide accommodation for about 100 children. The building has been designed by Mr. Geo. Hunt, architect, Evesham. The work was thrown open to public competition, and the lowest tender, namely, 890*l.*, sent in by Mr. Harvey Hunt, of Harvington, contractor, was accepted.

Ardwick.—The dedication stone of a new girls' school, which is being built in connexion with St. Thomas's Church, Ardwick, has been laid. Schools for boys and infants, in connexion with the church, were erected two years ago, at a cost of 4,200*l.*, and the school for girls now in course of erection will complete them. The site of the new building lies between the church and the boys' and infants' schools. The space obtained enabled the architects to design a commodious school, and at the same time to arrange spacious playgrounds both for the new schools and the boys' and infants' school. The building, which is two stories high, is of Gothic architecture. It will accommodate 300 girls and 70 infants. The contract for the building (without furniture or fittings) is 2,450*l.*, but with the cost of the land, furniture, and other incidental items added, the undertaking will cost about 4,000*l.* The drawings have been prepared by Messrs. Royle & Bennett, architects, and the works are being carried out under their superintendence by Mr. Robert Ellis, of Hulme.

TO ARCHITECTS.

At the special request of the Committee of Conference on Competitions we give a place to the following:—

The Conference Committee on Competitions will be glad to receive from provincial architects the earliest possible notice of proposed competitions, in order that the committee may in sufficient time transmit to the promoters of such competitions, for their guidance, copies of the regulations passed at the general conference of 1872.

Communications to be addressed to the Secretary of the Committee on Competitions, No. 9, Conduit-street, Hanover-square, W.

Books Received.

Manual of Buhl Work and Marquetry, with Practical Instructions to Carvers, and Ninety Coloured Designs. By W. Bemrose, Jun. London: Bemrose & Sons, Paternoster-row, and Derby.

As a sequel to the two works, "Manual of Carving" and "Fret-cutting," already favourably noticed in the *Builder*, and which have been so well received as to call for several editions, the author has been induced to add this other manual for the sister arts of buhl-work and marquetry, neither of which has, as yet, been practised to any great extent by amateurs, for whom this manual is intended. The tools and the instructions are simple, and this interesting and elegant art looks as if it were easily acquirable.

VARIORUM.

In the "Companion to the Almanac" for 1873, Mr. John Plummer, in an article on "Capital and Labour in 1872," writes,—

"With every increase in the number of workmen, unless accompanied by a corresponding increase in the demand for labour or in the amount of the wages fund, the difficulty of artificially controlling the rate of wages becomes more and more perceptible. But this is a fact which trade-unionists generally refuse to recognise; hence their numerous failures. To them, as to the greater portion of the labouring classes, the doctrines of political economy appear to operate unfairly, to be intended as an instrument in the hands of capital with which to tyrannise over labour. One effect of this lamentable prejudice has been to prevent workmen from availing themselves of the lessons to be derived from the study of the fundamental principles on which the doctrines of political economy are based, and thus avoid the disastrous errors committed by them in their ignorance of the inutility of the policy so often recommended by their leaders. It may appear a truism, but the one great truth which the labouring classes have yet to learn is that no efforts, however powerful or persistent, on the part of their trade organisations, can permanently raise the rate of wages, unless the increased scale of pay be accompanied by a proportional increase in the demand for labour; and that, on the other hand, no combination on the part of employers, however wealthy or influential, can prevent wages from rising when a decrease takes place in the amount of surplus labour,—in other words, when the demand for labour begins to overtake the supply. An illustration of this latter fact is to be found in the present state of industrial affairs in this country, the demand for labour being so great that good workmen experience little or no difficulty in obtaining employment at remunerative wages; indeed, the dearth of labour is so extensively felt, that more than once it has been recommended that a supply of labour should be obtained from those parts of the Continent in which the labour pressure is less perceptible. To whatever cause or causes may be ascribed the astonishing degree of national industrial activity and prosperity which has led to the present increased demand for labour, there can be no question that it constitutes one of the great social events of the present century, and is destined to play an important part in the elucidation of more than one of those important social and industrial problems, the solution of which has so frequently baffled the earnest efforts of our most thoughtful men."

Is it quite certain that the demand for labour is so great as the writer states?

Miscellanea.

The Drainage and Water Supply of Hornsea, in Yorkshire.—A special meeting of the Hornsea Board of Health has been held, Mr. J. A. Wade, the chairman, presiding. The chairman referred to the late inquiry commission, stating that the wisest course the Board could pursue would be to comply with the requirements of the commissioner, Mr. Harrison. He therefore moved, "That the Board take immediate steps to construct an efficient system of sewage and water supply." Attempts were made to put off the question of water supply, but the chairman said he thought they would be very foolish if they did not pass a resolution to do all that was required. To his mind the commissioner was as determined on the subject of the water supply as on any other, and a great point was made that the water supply was polluted by the sewage. He had evidently got the impression that the ground around the wells had been contaminated, and if it was as the commissioner supposed, it would take a generation to wear out that contamination; in fact, the contamination would be brought nearer and nearer to the well by the flow of water through the ground. After some further conversation, the chairman's resolution was put and carried unanimously. He further stated that he had asked Mr. C. F. Butler, as an engineer, for a statement of his terms. Mr. Butler had written stating that should he be engaged by the Board he was fully prepared to carry out an effective plan of drainage for the Hornsea district, and to obtain the approval of the Local Government Board for the same. His terms would be 5 per cent., with 20*l.* for travelling expenses. After some discussion, it was resolved "That the offer of Mr. Butler to design and carry out the drainage works of the Board, as contained in his letter of the 28th inst., be accepted." It was also resolved "That the surveyor be requested to ascertain the position of the water-wells and the sewage-tanks, and generally to report whether the houses have been carried out in accordance with the deposited plans and the bye-laws."

Assistant Surveyor to St. Pancras Vestry.—An assistant surveyor has been elected from the following candidates, nominated on the 20th ult.:—George William Brumell, William Henry Moxon, and Thomas Rust. The voting was by ballot, and resulted in the appointment of Mr. George William Brumell by a large majority.

The Demolition of St. Martin's Church, Birmingham. — The demolition of old St. Martin's Church is being vigorously proceeded with. At the east end the massive masonry has been broken into, and two fine windows, about 20 ft. in height, of the Decorated period, have been discovered,—one on the north, and a corresponding one on the south side of the chancel. The tracery of these has been carefully removed. At the east end of the north aisle part of the moulding of an altar window has been laid bare. The old monumental effigies have been moved from their modern brick bases in the windows; and a Jacobean monument of alabaster, with a shrouded bust surmounting the tablet, which was found built in the north wall, has likewise been transferred elsewhere for security. An interesting piece of painting has been brought to light in a roof-beam, which spanned the nave at a point about midway of the church, and which probably formed the top of the rood screen. On the front of this beam appears a painting (of the fourteenth century) of the head of Christ, wearing a crown of thorns, with surrounding nimbus; the uplifted hands, showing the marks of crucifixion, bear a scroll in each hand, but the Latin lettering on them is much defaced. Workshops for the new building are in course of erection on the north side of the yard. Mr. Chatwin, the architect, has made a plan of the inside of the church, so as to ensure the proper relaying of all the memorial tablets.

The Largest Yield of Coal on Record. A new method of working coal-mines was brought before the South Midland Institute of Mining, Civil, and Mechanical Engineers, at the meeting of that association, in Wolverhampton, on Monday week. Mr. John Gitting, who has the practical working of certain collieries at Wednesbury, showed that, by a system known to the coal trade as long work, in preference to square work, he had been enabled to bring up no less than 4,000 tons per acre, more than had before been realised. Thus he had now obtained 1,390 tons per acre, statute weight, and at the present price per ton of the mineral the colliery yielded 1,600*l.* per acre more as the selling price of the product than it would yield if square work were still adopted. Mr. E. Jones, the mining engineer of the Lilleshall Company, who is the president of the Institute, asserted that Mr. Gitting's figures showed he was obtaining the largest yield upon record at any colliery throughout England and Wales.

Chambered Barrows in France.—Last week a paper was read by the Rev. W. C. Luke, at the Society of Antiquaries of London, Somerset House, the title of which was "On certain Prevailing Errors respecting French Chambered Barrows"; Mr. Ouvry in the chair. There were certain opinions respecting the rude stone monuments or dolmens of France which he was convinced, after forty years' experience, were quite erroneous, and which it was important should be corrected. The writer then proceeded to support the theory that these dolmens,—even those that were now exposed,—were at one time surrounded by barrows, or envelopes, and that their exposition in the present day was due to the ravages of time. There was scarcely one of them that did not show traces of the envelope. Mr. Luke explained in detail the structure of the monuments he visited, and appealed to drawings which he made, and which were suspended on the walls, for confirmation of his view. He did not believe in the opinion that they were Christian structures.

The New Buildings at St. Luke's Workhouse.—The Local Government Board are again taking steps to compel the Holborn guardians forthwith to erect the new block of administrative buildings at St. Luke's Workhouse, which the guardians themselves some time ago proposed, and which was approved by the Central Board, but which the guardians subsequently refused to carry out, on the alleged grounds of a decrease of pauperism, and the liability of the workhouse for assessment to the rates of the parish of St. Leonard, Shoreditch. The Local Government Board have just forwarded a communication to the guardians, containing a peremptory request to them at once to proceed with the erection of the buildings, the total estimated cost of which is upwards of 25,000*l.*

The Steam-roller in Marylebone.—At the last meeting of the vestry a discussion arose on a report of the surveyor in favour of steam-rollers for roads. It was agreed that the advantages of the new system outweighed its disadvantages.

The Woolwich Steam-Hammer. — The largest of the massive iron plates intended to form the foundation of the immense steam-hammer about to be erected in the Royal Gun Factories, Royal Arsenal, Woolwich, has been cast in the Dial-square. The casting, which has consumed about 100 tons of metal, being an open one, presented a striking appearance. The operation, which required great care, was successfully performed under the direction of Mr. Vinicombe, principal foreman of the Dial-square. The molten metal having been collected in three enormous cupolas, at a given signal the whole was simultaneously poured into the mould. The heat from the molten metal, which covered an area of 24 ft., was so powerful as to break the glass in the open windows of the workshops. The large anvil-block for the same hammer, which was cast about three months since, is not yet cool enough for removal. This casting is the last required for the foundation of the steam-hammer.

Memorial Window.—A baptistery window has been recently erected in the church of St. Lawrence, Jewry, Gresham-street, City, in memory of John Andrew Back, who, with a mutual friend, in the year 1867, urged upon the Rev. B. M. Cowie, that advantage should be taken of the Pan-Anglican Synod then about to assemble, to create a fresh interest in missionary work in foreign lands. Its framework is an architectural composition of Renaissance character, with festoons of flowers and foliage and scrollwork, and with figures in niches. This encloses the two main subjects,—"The Passage of the Red Sea" and "The Baptism of Our Lord." The figures in the niches on each side are those of David and Aaron. The window is from the works of Messrs. Cox & Sons, of Southampton-street, Strand, and was exhibited in this year's International Exhibition at South Kensington.

Nottingham Architectural Association. An interesting paper was read by Mr. F. Bakewell, on Friday evening, November 29th, before this association, entitled "A Few Days in Belgium." At the close of the paper, an animated discussion took place, in which the president, Mr. T. C. Hine, Mr. Evans, Mr. Tarbotton, Mr. Norris, and others took part. The president, in continuation of some remarks by the author of the paper upon the size of Mediæval bricks, advocated a reduction of the thickness of bricks as productive of a more satisfactory appearance; and Mr. Norris called attention to the value of old English brickwork, and the beauty of the tints of the examples found in the southern part of England. Mr. Tarbotton regretted that Mr. Bakewell had not been able in the limits of his paper to give them more particulars of the brickwork of Bruges, alluding to several fine specimens there.

Scheme of Street Improvements in Sheffield.—Mr. Flockton has made a report to the town trustees, on the most eligible mode of improving the streets of Sheffield. He says, "It will be evident that a mere widening of existing streets (although that is very desirable on their own account) will not remedy the defects, nor supply the wants indicated. This can only be done by the opening out of fresh lines of road, and dividing the traffic, catching it before it reaches the heart, and tempting it by shorter distances, easier gradients, or other conveniences, out of the old routes into the new ones; and what may be called the internal circulation of the town must be provided for by new streets and improvements in the central portion. The scheme laid down on the plans is an endeavour to show how these views may be carried out."

Reclamation Scheme.—An Anglo-Italian company has been formed for the purpose of reclaiming the expanse of water in Northern Italy known as the Ferrara Marshes, covering nearly 200 square miles of what was once the most fertile land in Italy. Plans for accomplishing the work were solicited from hydraulic engineers in this country and on the Continent, and the choice fell on Messrs. John & Henry Gwynne, of Hammersmith, to whom the contract for the whole of the machinery has been given. The body of water to be drawn off the land is over 2,000 tons per minute.

Going to the Root of it.—A Connecticutter proposes to prevent the falling of leaves by the artificial warming of trees. He has invented a system of steam-pipes twining among the roots, and kept warm by steam from an ordinary furnace boiler. [ENGINE]

The Japanese. — On Tuesday last the Japanese ambassador and suite inspected Butler's Wharf, Shad Thames (the largest bonded warehouse in the port of London), and spent several hours in traversing the floors and examining the various classes of goods stored. They expressed their admiration of the new warehouses, and seemed much interested in watching the building works in progress, having ascended to the highest scaffolding for the purpose. This wharf has a frontage of over 500 ft., or about one-tenth of a mile on the river, with a landing-stage the whole length for large steam-vessels. The storage area exceeds ten acres. At the close of the inspection, Mr. F. L. Hutchins (Murray & Hutchins, Birchin-lane) introduced the architects, Messrs. Tolley & Dale, who handed a perspective view of the wharf and buildings to the visitors.

The Crown Co-operative Society.—Under this title a new society, with half a dozen directors of known respectability, is being formed to carry out the system of co-operation, by which articles of general consumption and utility are supplied at wholesale prices. It is intended to open stores in the first instance at Hyde Park, W., near the terminus of the Great Western Railway, in the centre of a neighbourhood where there is every chance of securing a large number of shareholders. Families also residing on the Great Western line, and in the West of England, will find these stores a great convenience. It is, likewise, in contemplation to establish branches in other parts of the metropolis where the want of such stores is most felt. Judging from the past, this Society would seem to have a good prospect of success.

Manchester and Salford Building Trades' Institute.—The annual meeting of this Institute, for technical education, has been held in St. John's Schools, Gartside-street, Mr. Isaac Holden in the chair. The report read by Mr. John M'Lean, mentioned that during the past year the efforts of the committee had been successful. The balance-sheet showed that the income had been 60*l.* 17*s.* 7½*d.* and that, after paying expenses, there was a balance in hand of 1*l.* 13*s.* 4½*d.* Mr. Thomas Lawton, in moving the adoption of the report, said he was at a loss to know why the union did not establish an institute for technical education. Mr. Thomas Spekeman seconded the motion, which was passed. Professor Greenwood, after distributing the prizes, made a few remarks. Other gentlemen addressed the meeting.

The Sanitary Act in Warwickshire.—A special meeting of the rural sanitary authority for the Warwick Union has been held at Warwick, to arrange for the provisions of the new Sanitary Act being carried out in the district. It was decided to appoint a committee, under the 13th section of the Act to discharge the duties of the sanitary authority for the current year; and to invite all the sanitary authorities in Warwickshire, with the exception of Birmingham, to a conference respecting the Act, the appointment of medical officers of health, and inspectors of nuisances, and the districts to be assigned to each throughout the county. The conference will take place at Warwick early in January.

Hastings Pier.—An apparatus for warming the Pier Pavilion, by hot water, has just been fitted by Messrs. Cumming & Edmonds, hot-water engineers, of Lilliebridge, Fulham, from the plans and under the superintendence of Messrs. Cross & Wells, architects, at a cost of 500*l.* A furnace has been fitted under the floor, and the pipes, coils, &c., have been carried to different parts of the structure. The coils will be covered with marble plates. Another improvement is the erection of lobby doors, inside the pavilion, at four of the principal entrances, so as to modify the in-rush of cold air from without. The heating apparatus will enable the directors to carry out the proposal to introduce a larger number of exotic and hot-house plants and flowers, and thus to give an improved appearance to the interior.

Camberwell Vestry has decided to put in force the stringent clauses of the Artizans' and Labourers' Dwellings Act in the cases of the premises, 18 and 19, Alpha-street, and 1 to 16, Bexley-court, Peckham, which the surveyor declares to be unfit for human habitation. Notices will be immediately served upon the owners, who will be cited to appear before the vestry, to show cause against the proposal to demolish the buildings.

Breach in the Sea Wall at Fambridge. The work of filling up a serious breach in the sea wall at South Fambridge, has not yet progressed so far as to stay the flooding of the adjacent land, but measures to remedy the evil have been vigorously taken up. Mr. Aire, of London, engineer, has the superintendence of the works, which are being carried out by Mr. Sutcliffe, also of London. The breach has continued to get larger each succeeding day, until now there is a gap of between 40 ft. and 50 ft., through which the water rushes, as the tide reaches its full flow, carrying away further fragments of the wall, and then spreading itself rapidly over the land, to the extent of some 150 acres and to a great depth.

Unveiling of the Neptune Fountain at Bristol.—The old metal statue of Neptune, erected so long since as the year 1588, by a citizen of Temple parish, has been removed (for the fourth time) from its position, and re-erected as a drinking-fountain in a commanding situation nearly opposite the entrance to the church, in Victoria-street; and has been publicly unveiled and opened for the use of the public. The figure faces towards the railway station, and stands on a pedestal of Pennant stone, with polished granite panels. The front and reverse slabs are fitted for jets of water, and galvanised iron cups are provided for the use of wayfarers, whilst beneath are troughs for dogs.

The Royal Academy.—On the 23rd inst there will be an election of a member of the Royal Academy, in the room of Mr. Pickersgill, now on the honorary retired list. It would seem to be time for adding a sculptor to the list of Academicians, and we shall be glad to see Mr. Joseph Durham selected for the vacancy. As the author of what we must consider the best out-door monument in London, excepting the great work in Hyde Park, viz., the Memorial of the Great Exhibition of 1851, in the Horticultural Gardens, not to mention many other admirable productions, Mr. Durham has high claims to the suffrages of the members.

The Collegiate Church, Wolverhampton. We are glad to hear that it has been resolved to remove the north and south galleries in this fine old church, and to reseat the nave under the direction of Mr. Christian. The observations made during the visit of the British Archæological Association doubtless gave an impetus to the movement. In reseating the church the old woodwork will be used as far as possible, and no material change will take place in the present form of arrangement. The total cost will be from 1,000*l.* to 1,200*l.*, and the estimate of Messrs. Higham has been accepted for the work.

The Mansion House, London.—When is the justice-room at the Mansion-house to be properly ventilated? asks the *City Press*. "At present the atmosphere is simply poisonous; and some of the officials who have to stand it day after day have suffered in consequence. It is simply a question of money; there ought to be no difficulty about it." We made the same inquiry some years ago, and were assured by the then City architect, Mr. Bunning, that it was more than a question of money. Surely, however, the difficulty cannot be insurmountable.

New Inventions: London International Exhibition, 1873.—The Committee on Recent Scientific Inventions and Discoveries have suggested as special subjects for exhibition in the class all new modes of preserving stone, or of rendering wood incombustible, or of purifying water, or of copying forms in wood or metal by machinery, &c. The applications for admission, it is arranged, must be sent in before the 31st of January, 1873.

Sculpture at the International Exhibition, 1873.—A meeting of sculptors, presided over by Mr. Durham, A.R.A., was held a few days ago at the Royal Albert Hall to inspect the space proposed to be devoted next year in the East Picture Gallery to British sculpture. After visiting the spot, a resolution was passed approving of the same. The committee adjourned to the 9th of January.

Prize Cabs and the Exhibition, 1873.—The Society of Arts have notified to her Majesty's Commissioners, that the time during which cabs submitted for competition for prizes must have been running in London and other towns, has been reduced from three months to one month. The prizes offered are, as has already been announced, one of 60*l.*, two of 20*l.* each, and two of 10*l.* each.

Scientific Lectures in Shoreditch.—A series of scientific lectures are to be delivered in the Shoreditch Town-hall by Professors Carpenter, Norman Lockyer, and Simmons, during the winter. The object of the lectures is to give the working population some scientific instruction at a nominal charge. The vestry have unanimously granted the Town-hall for the purpose at a reduced rental.

Monument to a late Governor of Jersey.—The Jersey States, at a special meeting, have agreed, without a dissentient, to a vote of 1,000*l.* for the erection of a monument in memory of General Don, who twice occupied the post of governor of that island, commenced the erection of Fort Regent, and planted the military roads, for which Jersey is so well known. The monument is from a design by M. Robinet, a French sculptor.

The Birkenhead Theatre Royal.—This theatre, which was built by a limited liability company, has been sold by auction at the instance of the mortgagees. The property originally cost 20,000*l.*, and was knocked down to Mr. Elias Gaskell, one of the shareholders, for 8,000*l.*

St. John's Wood.—On Saturday, 7th, the Princess Christian laid the foundation-stone of St. Mark's Parochial Schools, Hamilton-terrace, St. John's Wood. A large marquee was erected on the site, and this was crowded by a congregation composed almost entirely of ladies.

TENDERS

For additions to the Castle, Woodside, near Torrington Park Station, Finchley, for Mr. W. B. Jones:—

Blease	£890	0	0!
Lewis	846	0	0
Holding	799	0	0
Strange	791	0	0
Hingston	749	0	0
Petley	725	0	0
Jackson	723	0	0
Webster	650	0	0
McLean	647	0	0
Kelly	620	0	0
Watkins	610	0	0
Pryors, Bros.	580	0	0
Warr	535	0	0
Butford	364	0	0!

For new surgery and dispensing-room, at the Manor House, Brixton-hill, for Dr. Chaning Pearse. Mr. Chas. Sewell, architect:—

Rowe & Verran (accepted)	£108	15	0

For the erection of a warehouse in St. Bride-street, Ludgate-circus (exclusive of fittings). Mr. H. H. Bridgman, architect:—

Perry & Co. (late)	£2,250	0	0
Browne & Robinson	2,200	0	0
Kelly, Bros.	2,173	0	0
Crockett	2,045	0	0
Falkner	1,996	0	0
Scrivener & White	1,954	0	0
Elkington*	1,939	0	0

* Amended tender:—Additional roof story, £2,025 net (accepted).

For new work-rooms at the Alexandra Institution for the Blind, Queen-square. Mr. Joseph Peacock, architect. Quantities by Messrs. Gardiner, Son, & Theobald:—

Adamson & Sons	£625	0	0
Lathey, Bros. (accepted)	593	0	0

For Mission-room, Walham-green. Mr. H. Gregg, architect. Quantities not supplied:—

Perry, Bros.	£455	0	0
Brown	446	10	0
Thompson & Smith	437	0	0

For erecting houses and stabling in Little Queen-street, Edgware-road, for Mr. A. J. W. Keucke. Quantities by Messrs. New & Cumings:—

Aitchison & Walker	£3,745	0	0
Thompson & Smith	3,697	0	0
Mark	3,644	0	0
Aylett	3,509	0	0
Snowball	2,992	0	0

For the erection of a Danish Chapel in King-street, Poplar. Mr. J. W. Morris, architect:—

Chissell	£789	0	0
Abraham	769	0	0
Mark	758	0	0
Watts	750	0	0
Addington & Co.	725	0	0

For finishing two houses, 13 and 14, Charlton-villas, Church-lane, Charlton. Mr. J. Comfort, architect:—

West (accepted)	£570	0	0

For schools, Cottenham-road, Holloway, for the School Board for London. Mr. Lacy W. Ridge, architect. Quantities by Mr. L. C. Riddett:—

Newman & Mann	£7,240	0	0
Nightingale	7,189	0	0
Williams & Son	7,160	0	0
Wicks, Bangs, & Co.	6,980	0	0
Roberts	6,944	0	0
Adamson & Son	6,941	0	0
King & Son	,892	0	0
High	6,790	0	0
Patman & Fotheringham	6,710	0	0
Niblett & Son	6,630	0	0
Scrivener & White	6,471	0	0

For building a new Rectory House at Benwick, Cambridgeshire. Mr. William Smith, architect, Adelphi, London:—

Fast	£2,065	0	0
Bennett	1,880	0	0
Bateman (accepted)	1,844	0	0

For erecting schools at Benwick, Cambridgeshire. Mr. William Smith, architect:—

Phillips	£1,663	5	4
Hutchinson	1,439	0	0
Downs	1,400	0	0
Bennett	1,390	0	0
Bennett, Bros.	1,260	0	0
Swann (accepted)	1,240	0	0

For erecting schools at Weston Hills, Lincolnshire. Mr. William Smith, architect:—

Moore (accepted)	£499	0	0

For erecting schools at Spalding Marsh, Lincolnshire. Mr. William Smith, architect:—

Moore (accepted)	£598	0	0

For ice-well at No. 40 Wharf, City-road Basin, for Messrs. Marioni & Co.:—

Kingston	£1,982	0	0
Bennett & Watts	1,531	0	0
Kelk & Co.	1,422	0	0
Adlard (accepted)	1,350	0	0
Turrel, Bros.	1,335	0	0
Box	1,250	0	0
Beach	1,250	0	0
Johnson	1,197	0	0

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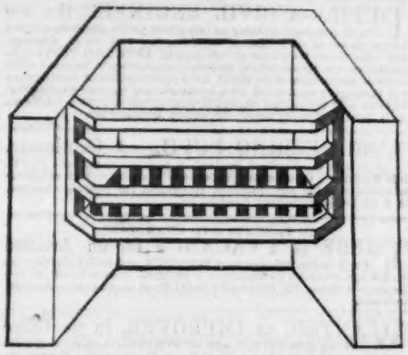

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9. The management as Engineer, when and if required, of the waterworks supplying the town, so far as they are completed and when completed, and, if required, the management of all the works.
10. All other duties which may be required of him by the Council or the Committees thereof, and which in the opinion of the Council they may consider within the duties of his appointment.
11. To devote the whole of his time to the duties of his office, and not to be engaged in any other office, business, or employment whatever.

Salary 600*l.* per annum. The Corporation will in addition provide all necessary clerks and other assistants, offices, stationery, and other working materials. Applications to be addressed to the undersigned, endorsed "Application for Appointment of Borough Engineer and Surveyor," and sent on or before SATURDAY, the 21st DECEMBER instant.—By order, CAPEL A. CURWOOD, Town Clerk.

Leeds, 4th December, 1872.

TO ENGINEERS, SURVEYORS, AND OTHERS.

THE Town Council of the Borough of Dorchester desire to procure a competent Person to discharge the general duties of SURVEYOR to the Council. He will be required to reside within the borough, and superintend the management of the Corporate property, the waterworks, highways, and general works of drainage, and water supply, and to design, carry out, and record all such works on the General Plan of the Borough as necessity may arise. Applications (accompanied by testimonials) stating age, qualifications, and salary required, to be made in writing, and delivered at the Office of the Town Clerk, in Dorchester, on or before the 6th of JANUARY next.

Dated December 11th, 1872.

LOCAL BOARD of HEALTH and URBAN SANITARY AUTHORITY for the DISTRICT of KINGSTON-UPON-HULL.—To FOREMEN of ROADS.—The Local Board of Health and Urban Sanitary Authority for the District of Kingston-upon-Hull require the SERVICES of a STREET FOREMAN, and are prepared to receive APPLICATIONS from properly qualified persons. The situation will be held under the Surveyor, and the duties will consist in Superintending the Construction and Repairs of Street Surface Work, including paved and macadamized roads; also the Keeping of the usual Foreman's accounts. The hours of service will be 6 a.m. to 5.30 p.m. and the Wages 2*l.* per Week. Applications, stating age and previous employment, accompanied by references, are to be forwarded under cover, endorsed "Streets Foreman's Application," to C. S. TODD, Esq. Clerk to the Board, Townhall, Hull, on or before WEDNESDAY, the 18th day of DECEMBER, 1871.—By order, J. FOX SHARP,

Borough Engineer and Surveyor to the Board.

Surveyor's Office, Town-hall, Hull, 6th December, 1872.

BRIDGNORTH UNION.—APPOINTMENT of an INSPECTOR of NUISANCES.—The Rural Sanitary Authority of this Union will, on SATURDAY, the 28th day of DECEMBER inst. APPOINT an INSPECTOR of NUISANCES for the district of the Bridgnorth Union, comprising an area of 62,679 acres, and a population of 8,903. The appointment will be subject to the approval of the Local Government Board, and will, in the first instance, be made up to the 18th day of APRIL, 1873, only, and the remuneration for that period will be Fifty Guineas, after which a fresh arrangement will be made. The duties will be:—

1. To make a complete sanitary survey of the whole district, and to furnish a detailed report thereon to the Sanitary Authority by the 22nd day of March next.
2. Those contained in the order of the Local Government Board, dated the 11th day of November, 1872, and in such other orders as the Board may from time to time issue.

Candidates are requested to send applications, in their own handwriting, to me, the undersigned, stating age, residence, past and present occupations, with recent testimonials as to qualifications, and character, on or before FRIDAY, the 20th day of DECEMBER inst.—By order, WM. REYNOLDS, Clerk.

Bridgnorth, 6th December, 1872.

WANTED, immediately, a MAN, competent to WORK a STEAM MOULDING and PLANING MACHINE.—Apply to Messrs. AITCHISON & WALKER, Portland Yard, William-street, St. John's Wood, with usual particulars and references.

WANTED, a DRAUGHTSMAN, accustomed to free-hand design and ornamental metal-work.—Apply, by letter only, with full particulars, to C. C. at Negus's, Stationer, 14, Charles-street, St. James's, S.W.

WANTED, in the Suburbs of London, a thoroughly experienced MAN, to take charge and superintend the working of SAWING and JOINER'S MACHINERY.—Apply, by letter only, stating age, salary required, and references, to A. J. care of Mr. W. N. Proy, 146, King-street West, Hammersmith.

WANTED, a MANAGER, for STONEWARE PIPE-WORK.—Applications to be addressed, U. 5,964, Mr. Frederic Algar, 8, Clement's-lane, Lombard-street, London.

WANTED, by a London Builder and Contractor, a thoroughly efficient MANAGER and REPRESENTATIVE. Must have a thorough knowledge of the business in all its branches, and capable of estimating, measuring, &c. One who has filled a similar situation preferred. A liberal salary would be given.—Address, stating age and full particulars, to 71, Office of "The Builder."

TO BUILDERS' CLERKS.

WANTED, by a Builder, in the country, a YOUNG MAN to TAKE CHARGE of the BOOKS, measure up materials, &c.—Address, stating age, salary required, and where last employed, to S. C. PARMENTER, Railway-street, Braintree, Essex.

WANTED, a WORKING SHOP FOREMAN of JOINERS.—Address, stating wages required, where and for how long in last employ, with references, to 197, Office of "The Builder."

WANTED, a good JOINER, one used to hard wood work.—Apply by letter only, to J. W. 13, Maiden-lane, W.C. None need apply unless first-class, quick workmen.

WANTED, in a Builder's Office, a YOUTH, to KEEP TIME, and assist generally.—Apply, in own handwriting, stating salary required, to M. S. 23, Upper Thames-street.

WANTED, a YOUTH, for Taking Time, Keeping Account of Goods going out and coming in; also for Making Plans and Working Drawings of Encaustic Tile Floors. Calculating Quantities, &c. He must write a good hand.—Address, THE ARCHITECTURAL POTTERY COMPANY, Poole, Dorset.

TO SAW-SHARPENERS.—WANTED, a first-class MACHINE SAW-SHARPENER, for a constancy.—Apply, with references and full particulars, to JOHN PERRY & CO. Tredegar Works, Bow, E.

PAPERHANGINGS.—WANTED, an energetic Man, of good address, to wait upon West-end Builders and Decorators. To a first-class REPRESENTATIVE liberal terms will be offered.—Address, 61, Office of "The Builder."

BUILDER'S CLERK (Junior) WANTED. Age about 21.—Apply, by letter only, to W. B. 47, Old-street, E.C.

WANTED, by a DRAUGHTSMAN, a RE-ENGAGEMENT. Thoroughly conversant with the duties of an architect's office, including perspective.—Address, No. 105, Office of "The Builder."

WANTED, a SITUATION as JUNIOR ASSISTANT in an ARCHITECT'S Office. Age 19.—Address, W. C. RIDDICK, Effra-road, Brixton, S.W.

TO BUILDERS AND CONTRACTORS.

WANTED, an ENGAGEMENT, by a JUNIOR CLERK. Well versed in the general routine of a builder's office. Good tracer. Excellent references.—Address, J. E. F. care of Mr. Edgar, No. 2, Bloomfield-terrace, Bloomfield-road, Bow Common, E.

WANTED, immediate RE-ENGAGEMENT, by a trustworthy and efficient SHOP FOREMAN of JOINERS and thoroughly practical MACHINIST, whose system of working shop and mill in conjunction greatly economises labour. No objection to the exclusive management of either department or fill up time in the office. (Joiner). Salary 42*s.*—Address, VERITAS, No. 2, Exeter-place, Walham-Green, London.

TO BUILDERS.

WANTED, a RE-ENGAGEMENT, as GENERAL FOREMAN. Carpenter by trade. Good references.—Address, ALPHA, 3, Hope Cottages, Clarendon-road, Hornsey.

TO ARCHITECTS.

WANTED, a RE-ENGAGEMENT, by a respectable young Man, aged 19. Writes a good hand, and is used to the general routine of an office. Good reference.—Address, R. T. Springfield-street, Chelmsford.

TO CIVIL ENGINEERS AND OTHERS.

WANTED, a RE-ENGAGEMENT, as CLERK of WORKS or MANAGER, by a thoroughly practical Man, well up in tunnelling and heavy building operations.—Address, C. L. 1, Suffolk-place, Pall-mall, London.

TO BUILDERS, CONTRACTORS, &c.

WANTED, a RE-ENGAGEMENT as CLERK. Age 29. Accustomed to all the duties of a builder's office. Good accountant. Excellent references from large London firms.—A. 40, Heygate-street, Walworth-road, S.E.

TO GENTLEMEN AND BRICKMAKERS.

WANTED, a RE-ENGAGEMENT, to Dig, Make, and Burn BRICKS, TILES, &c. at per thousand (Labour only), in close or Scotch kilns, or clamp-work. Twenty-three years' experience. Good reference, and security if required.—Address, A. B. care of Mr. Pearce, 24, High-street, Tunbridge Wells.

TO ARCHITECTS AND SURVEYORS.

WANTED, a RE-ENGAGEMENT, by an ARCHITECTURAL ASSISTANT of eight years' experience in both London and provincial offices, who has a fair knowledge of quantities, and practical knowledge of construction. Satisfactory references. Terms moderate.—Address, W. D. 115, Cottenham-street, Upper Brook-street, Manchester.

TO BUILDERS, PLUMBERS, &c.

WANTED, by a good PLUMBER, &c. a JOB or CONSTANCY. Good reference.—Address, C. BAKER, No. 25, Bradmore Park-road, Hammersmith, W.

TO PLUMBERS AND BUILDERS.

WANTED, by a steady young Man, a CONSTANT SHOP. Is a good PLUMBER, and would fill up time in other branches of the trade.—Address, 93, Office of "The Builder."

WANTED, by a practical BUILDER and HOUSE DECORATOR, of twenty-five years' experience, the ALTERATION or REPAIR of HOUSES, or PIECEWORK, either old or new. With or without material. Can give unexceptionable reference to carry out any job he may undertake.—Address, 102, Office of "The Builder."

WANTED, by a Builder, an opportunity to recommend a young Man as JUNIOR, in a first-class Builder's Office. Well up to tracing, assistant book-keeping, and general office work; knowledge of perspective. Salary moderate.—Address, U. R. 51, Brownlow-road, Dalston.